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ABSTRACT

This 16-hour course was designed to teach the minimum computer literacy objectives set forth by a mandate from the Virginia Board of Education. The course also prepares teachers to use the word processor. The inservice package is comprised of five units: (1) introduction to the computer; (2) computer-assisted instruction; (3) computor programming (LOGO or BASIC); (4) word processing; and (5) computers in society. Equipment and materials required include the Apple II+, IIe, or IIc computer systems. Specific software needed is listed at the beginning of each unit. Each unit is written so that a large percentage of the work can be completed as a self-paced independent study package. It is recommended, however, that as much of the program as feasible be completed in a group situation with a computer coordinator or group leader available to assist participants. It is also recommended that unit activities be completed in pairs, two participants per computer. (JD)

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COMPUTER LITERACY IN-SERVICE TRAINING PROGRAM

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COMPUTER LITERACY
IN-SERVICE TRAINING PROGRAM

BATH COUNTY PUBLIC SCHOOLS
WARM SPRINGS, VIRGINIA 24484

PERCY C. NOWLIN, III, SUPERINTENDENT

THE FOLLOWING BATH COUNTY EDUCATORS DEVELOPED THIS IN-SERVICE PACKAGE:

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BATH COUNTY PUBLIC SCHOOLS
COMPUTER LITERACY IN-SERVICE TRAINING PROGRAM

16-Hour, Non-College Credit Course

PURPOSE:

In July 1983, the Virginia Board of Education mandated the following accreditation standard:

By graduation each student shall be provided educational experiences directed toward objectives outlined in COMPUTER LITERACY FOR STUDENTS IN VIRGINIA issued by the Department of Education.

This 16-hour course was designed to teach the minimum computer literacy objectives (Level I, BASIC LITERACY) set forth by the state. In addition, the course prepares teachers to use the most valuable computer application: word processing.

DELIVERY STRATEGIES:

The in-service package is comprised of the following five units.

	Unit	Estimated Time Required:
Unit I:	**Introduction to the Computer**	**3 hours**
II:	**Computer-Assisted Instructions**	**4 hours**
III:	**Computer Programming (LOGO or BASIC)**	**4 hours**
IV:	**Word Processing**	**3 hours**
V:	**Computers In Society**	**2 hours**

Each unit was written such that a large percentage of the work can be completed as a self-paced independent study package. However, based on two years of experience with the program, it is recommended that as much of the program as feasible be completed in a group situation with a computer coordinator or group leader available to assist participants. Some individuals have completed the units with minimal assistance, but the majority of participants have preferred a group learning experience. Likewise, it is recommended that unit activities be completed in pairs, two participants per computer.

EQUIPMENT AND MATERIALS REQUIRED:

Apple II+, IIe, or IIc computer systems (Unit IV requires a IIe or IIc and a printer)

SOFTWARE: Listed at the beginning of each unit.

OTHER: Videotape: On and About Instructions ... Microcomputers, program #2*
On and About Instructions ... Microcomputers, program #16 (optional)

OPTIONAL: A pre- and post test
Unit evaluation forms

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* Contact the Virginia Department of Education to obtain copies of the 16-part videotape series On and About Instruction ... Microcomputers. One of several other commercial filmstrips on the topic of computers in society may be used in place of program #2.

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OBJECTIVES:

Unit I: Introduction to the Computer

1. The educator will define selected computer terminology.
2. The educator will identify the basic components of a computer and describe the function of each.
3. The educator will load and run selected software.
4. The educator will interact with the computer using keyboarding skills.

Unit II: Computer-Assisted Instructions

1. The educator will describe the ways the computer can be used in teaching and learning.
2. The educator will use evaluative criteria to select software that matches goals and objectives established in the school curriculum.
3. The educator will choose the computer as a teaching tool when it improves or enhances instruction and then design lesson plans that effectively integrate the computer into an instructional unit.
4. The educator will identify electronic databases as information sources.

Unit III: Introduction to Programming

1. The educator will select and use an appropriate program to accomplish a given task.
2. The educator will describe a computer program.
3. The educator will be given a problem which will require the writing of a simple program.

Unit IV: Word Processing

1. The educator will use the PFS: WRITE word processing program to prepare, print, and store documents.

Unit V: Computers in Society

1. The educator will describe the impact of computers on society.
2. The educator will identify ethical, social, and economic issues relating to the use of computers.
3. The educator will recognize the value of computer skills for future education and employment.

EVALUATION RESULTS:

The appendix includes copies of evaluation forms that schools may choose to use to evaluate the effectiveness of the in-service program. Eighty-two Bath County educators completed one or more of these forms while taking the in-service program in the fall of 1983 or 1984. Results of their evaluations are shown in the appendix. Note that no results for the pretest/post test are presented because the current form was not used with the participants. However, the results of the previously used computer literacy pre- and post test showed that the mean percent correct for the 18 items was 39 on the pretest and 92 on the post test (completed by 57 participants). Overall, the results were highly favorable; 17 of the 27 objectives were judged by 90% or more of the participants as being achieved, and 24 of the 27 objectives were judged by 75% or more of the participants as being achieved.

UNIT: I

INTRODUCTION TO THE COMPUTER

WELCOME!
D. Rogers

UNIT I: INTRODUCTION TO THE COMPUTER

The purpose of Unit I is to introduce the basic terminology and computer components that you should know in order to understand how a computer works (as well as to understand what students are saying in the classroom and for you to impress your peers by speaking "computerese" at popular parties).

More importantly, this unit is designed to provide "hands-on" experience with an Apple computer. After learning how to load and run a few selected programs, you should feel comfortable with using most "user-friendly" software packages.

Unit Objectives:

1. The educator will define selected computer terminology. This should include:
   a. Hardware components; e.g., CPU, disk drive, monitor, keyboard;
   b. Functions; e.g., input, processing, output; and
   c. Procedures; e.g., load, list, catalog, save, and run.
2. The educator will identify the basic components of a computer and describe the function of each. This should include:
   a. Central processing unit;
   b. Types of memory; and
   c. Input/output devices.
3. The educator will load and run selected software. This should include:
   a. Setting up and turning on the computer;
   b. Loading the cassette tape or disk; and
   c. Issuing commands necessary to run selected software.
4. The educator will interact with the computer using keyboarding skills. This should include:
   a. Alphanumeric keys;
   b. Special function keys, e.g. Break, Control, Return, CTRL, and Reset.

Unit Requirements: Total of 3 hours of work:

- Read the entire package prior to class session (1 hour).
- Attend a two-hour-class session using the computer, or attend a one-hour-class session and spend at least one hour completing the assignment on an independent-study basis.

Equipment and Materials Needed:

Apple II+, IIe, or IIc computer system
"Apple Presents ... Apple" software program (Activity 1)

"Dos 3.3 System Master Diskette" and the "Sample Programs" diskette (Activity 2)
(Use only tan label "System Master Diskette" -- do not use older white label version.)

ACTIVITY I: (to be completed in class, with supervision)

Computers are for doing, not reading about, so let's get started!

A. THREE APPLES

Three models of Apple computers may be found in your school: the Apple II+, Apple IIe and Apple IIc. After determining which model you will use, obtain the appropriate introductory "program" for that model. The "program" is recorded on what's known as a floppy diskette (5 1/4 inch square "card" with a flexible circular material inside that spins like a phonograph record). The introductory program for each computer model is listed below:

Apple II+	"Apple Presents...Apple" -- white diskette
Apple IIe	"Apple Presents ... Apple" -- tan diskette
Apple IIc	"Apple Presents the IIc, An Introduction"

*The "Apple Presents... Apple" diskette is not the same as the "DOS 3.3 System Master" or "Sample Programs" which you will need later.

B. GETTING STARTED

Hold the introductory program diskette with the label UP and your thumb ON THE LABEL. Insert the diskette into the horizontal slot of the disk drive (the small box beside the computer, or the slot on the right side of the IIc) and close the latch.

Your Apple computer (II, II+, or IIe) may have a box-like device called a System Saver mounted on the left side of the computer. This device allows you to plug all the computer equipment into one outlet and to start the whole system with only one switch. It also contains a "line surge suppressor" that reduces the chance of damage from electrical surges. If your computer has a System Saver, turn on the red switch that is facing you. If it does not have a System Saver, or if you have an Apple IIc, reach around behind the left side of the computer and turn on the computer's switch. You will also need to turn on the monitor (i.e., the video screen).

The computer will make a beeping sound and the power light on the keyboard will come on. The disk drive will make a noise for a few seconds and a small red light on the disk drive will come on whenever the drive is being used. This is a warning light: do not touch the disk drive when the light is on. Information on the screen will then guide you through the program. You will be introduced to many computer terms and all features of the keyboard. Topics include how to start and stop programs, how to correct mistakes, the different types of cursors (a cursor is not a person who swears at computers), and much more.

After completing all lessons on this program (requires about 30 minutes) turn the computer off and carefully remove the diskette.

BASIC PARTS OF A COMPUTER SYSTEM

Hardware and Software are the basic parts of a computer system. Hardware is the computer and all of the equipment hooked up to it. Software consists of the bundles of instructions (programs) and information (data) which are fed into the computer's memory to be processed.

I. HARDWARE COMPONENTS

A. CENTRAL PROCESSING UNIT -- the "brain" of the computer

The Central Processing Unit, or CPU, is the part of the computer that actually does the computing. It obtains the information from the computer's "memory" and manipulates this information as it is "programmed" to do. These programs, or bundles of instructions, are also found in the computer's memory. They have been put there by the operator of the computer. We will discuss how the operator "programs" the computer later. The three parts of the CPU are the arithmetic/logic unit, control unit and main memory. When the system is started, the CPU looks into the first position of memory, carries out the instructions, and moves on to the next position. The CPU finds, transfers, compares, and combines items as it is instructed.

Computers only understand (are able to act upon) machine, or assembly, language which is a code that triggers on/off differences in the computer's electronic circuity. Because machine language is very difficult and cumbersome to use, other more English-like languages have been developed, the most common being BASIC. The computer can understand instructions written in BASIC and other languages, but only if they are first translated into machine language. This translation is done by the compiler, or interpreter program, located in the Central Processing Unit (CPU). Some of the common computer languages that are translated into machine language by the compiler are:

BASIC	Beginners All-purpose Symbolic Instruction Code
PASCAL	named after Blaise Pascal
COBOL	Common Business Oriented Language
FORTRAN	Formula Translator
R.P.G.	Report Program Generator
Logo	A language most widely used in elementary schools, but appropriate for all age groups.

BASIC is the language most often used in home and school microcomputers. Unfortunately, because there are different versions of BASIC, a program written for one brand of computers will probably not run on another.

B. RANDOM ACCESS MEMORY

The Random Access Memory, or RAM, consists of the computer's main memory. It is the CPU's main information storage area. This main memory is filled with programs and data by use of input devices (described below). One piece of memory is called a byte. Apple computers in schools typically have from 48,000 (48K) to 128,000 (128K) bytes of memory.

C. READ-ONLY MEMORY

Read-Only Memory, or ROM, consists of information which has been written into the computer's permanent memory during manufacturing and cannot be erased or changed as can information in RAM.

D. INPUT DEVICES

Input devices send information to the computer. The input devices we will be dealing with consist of the keyboard and the disk drive. The keyboard is very similar to a typewriter. It allows the operator to communicate directly with the computer. Information is sent to the CPU's main storage by use of the keys.

The disk drive reads and writes information on a magnetic diskette for repeated use. (These diskettes are discussed in the Software section.)

Other input devices include a cassette player, graphics tablet, a mouse, optical mark reader, and a numeric keypad.

E. OUTPUT DEVICES

Several kinds of equipment are used by the computer as output devices. Output devices transfer information to an external location. These devices include the video screen, the printer, and the disk drive. Some devices, such as the disk drive, are used for both input and output. The most common output device is the video screen, which can be an ordinary television or a "monitor" designed specifically for computer use. The video screen displays information sent by the user through instruction to the computer. As the user types information or instructions on the keyboard, the characters are shown on the screen, much as a typewriter works with paper.

The computer can be instructed to transfer the output to a printer which prints the information on paper. This printed paper is called the printout or hard copy.

The computer can also be instructed to store the instructions and information by outputting it to the disk drive, which records it on a diskette for future use. The process can be compared to the use of a tape recorder. Prior to the development of disk drives, tape recorders were used in the same capacity. They are still used today, but their use is becoming more limited because of their slow speed and small storage capacity.

II. SOFTWARE

Diskettes are the only type of software that we will be using. Diskettes are used for permanent storage of programs. Instructions and information are stored on diskettes in the form of magnetic impulses that the disk drive can read and transfer to the computer's RAM. A program is a set of instructions that orders the computer to follow some specific task. Be sure to always return a diskette to its sleeve and storage box. Dust, dirt and fingerprints on the exposed inner material of the diskette will ruin it.

III. BASIC COMMANDS

Most home and school computers use the BASIC language. Some of the most common BASIC instructions or commands are described below:

A. LOAD

This is a command given to the computer to transfer information from the diskette into the computer's memory, RAM.

B. LIST

When a computer is given this command, it will list line-by-line the program in its memory. The computer will also list a specific line of a program if asked to do so.

C. CATALOG

This command will display a diskette's table of contents or a list of all the programs on a diskette.

D. SAVE

When the computer operator writes a program or inputs data by means of the keyboard, it may be transferred to the diskette for storage by means of the SAVE command.

E. RUN

This is the command to "run", or to execute, the program in the computer's memory.

ACTIVITY II:

We have discussed the components and some of the frequently used commands of a computer system. Now let's go to the computer for some "hands-on" experience using the above commands. Such experience may prove to be helpful if you ever use a program that is not a "user-friendly" as the "Apple Presents...Apple" program.

1. Insert the DOS 3.3 SYSTEM MASTER diskette into the disk drive and turn the computer on.

   After a few seconds, a symbol called a prompt should appear on the screen below other introductory text. (It appears as a right 'bracket' symbol "]".) The prompt indicates the computer is ready and waiting for your instructions. The cursor (flashing light) shows where the next character that you type will appear.

   The IIe and IIc have a CAPS LOCK key. When depressed, all letters will be capitalized. Numeric and punctuation keys are not affected by the CAPS LOCK. **KEEP THE CAPS LOCK KEY DEPRESSED THROUGHOUT THIS UNIT.**

2. Try typing some characters. What you type appears on the monitor. In order for the computer to understand a command, it must be typed in capital letters. To enter a command into the computer, type the instruction and then press the RETURN key.

   If the computer does not understand a command, it will "beeb" and print SYNTAX ERROR. If a statement is misspelled or otherwise not typed correctly, the computer will not accept it. The computer is very picky - entries must be exact.

How To See What's On a Disk

1. Remove the "tan label" System Master diskette and insert a "Sample Programs" diskette.

2. The stored information on this diskette was given file names when SAVED. To take a look at the file names, or table of contents, type CATALOG and press RETURN. The disk drive will make some noise and after a few seconds the "catalog" will appear on the screen.

3. You can try any program with an A (for Applesoft BASIC) or an I (for Integer BASIC) in front of the name. Both Applesoft and Integer BASIC are languages the computer understands. Let's run the program- APPLEVISION. Type RUN APPLEVISION and press RETURN. It will take a few seconds for the computer to find, load, and start the program called APPLEVISION. When you want this program to stop, press the ESC key.

4. Other programs you may want to run are ANIMALS, PHONE LIST, and BRICKOUT.

5. Two other commands introduced earlier are LOAD and LIST. Type LOAD APPLEVISION and press RETURN. After the disk drive has finished spinning, a prompt should appear on the next line of the monitor. The program is now in the computer's memory (RAM).

   Now type LIST. The many lines of the program will "scroll" up the screen. This should give you an idea of what is involved in developing a simple program!

   Because the program is in the computer's memory, you can start the program by simply typing RUN and pressing RETURN. Type RUN and RETURN.

ACTIVITY III:

How To Stop A Program

There will be times when you want to stop a program. Often a program will tell you how to stop it. If not, try one of the following methods:

1. Press the ESC key. This key is in the upper left-hand corner of the keyboard. This key stands for ESCAPE; sometimes it will help you escape from a program; or

2. Press the CONTROL key (CTRL) and the letter C. In many programs, CONTROL C means to cancel; or

3. CONTROL C and the RETURN key. At times by pressing the RETURN key, you are enforcing your statement; or

4. Press CONTROL RESET. The program will stop or return to the opening statement. You must be careful with this command because it could erase what is stored in temporary memory. This procedure may restart the whole system.

5. As a last resort, turn off the power. When the power is cut off, it will automatically erase your current work that is in the main memory.

RUN and then try to stop a program on the SAMPLE PROGRAMS diskette.

DIFFERENT APPLES

Not all computers work the same, and neither do all Apple computers. Apple Computer Inc. first created the Apple (now worth $15,000 as a collector's item) and then the Apple II, the II+, the IIe, and most recently the IIc, mainly for the home and educational markets (the Apple III, Lisa, Lisa II, and MacIntosh were built for the business community).

The differences between the Apple II+, IIe, and IIc that you should be most aware of are the differences in the keyboards and the memory (i.e., the amount of information that each model is capable of handling).

1. KEYBOARD DIFFERENCES

The Apple IIe and IIc have almost identical keyboards with the exception of the RESET key being in a different location. Several important changes, however, were made from the earlier Apple II and II+ keyboards:

IIe & IIc FEATURES

CAPS LOCK	When depressed, all letters will be capitalized. Numeric and punctuation keys are not affected. KEEP THE CAPS LOCK KEY DEPRESSED THROUGHOUT THESE UNITS (except Unit IV Word Processing).
OPEN APPLE & CLOSED APPLE	Control characters used in some programs.
DELETE	Deletes the previous character.
TAB	Moves the cursor to the next tap setting (usually preset to multiples of eight characters).
UP & DOWN ARROWS	Used in programs to move the cursor vertically.

One other keyboard change worth mentioning is the deletion of the REPEAT key in the IIe and IIc. Whereas the II+ requires that you hold a key down and press the REPEAT key to repeat a character, you only need to depress the key for the character and keep it depressed to repeat a character using the IIe or IIc.

2. MEMORY DIFFERENCES

Apple has continued to upgrade their computers as new technological advances have enabled them to do so. The II+ is equipped with 48K (48,000 bytes) memory. The standard IIe has 64K and the IIc has 128K. Different software programs require varying amounts of memory. If a program requires 128K, it will not run on a standard Apple II+ or IIe. However, the majority of software developed for the 48K II+ will run on all Apples in the schools. Fortunately, most educational software is written for the 48K II+. (Also, note that the II+'s in Bath have been upgraded to 64K, allowing greater compatibility of software.

ACTIVITY IV: Review of key functions

Match the keys to the explanations.

____ 1. RETURN

____ 2. Left Arrow

____ 3. 0

____ 4. ESC

____ 5. CAPS LOCK

____ 6. Up Arrow

____ 7. Space Bar

____ 8. CTRL RESET

____ 9. SHIFT

____ 10. Cursor

____ 11. TAB

a. press to put spaces between characters
b. used to stop a program only if nothing else works (other than turning the off)
c. moves the cursor vertically
d. moves the cursor to the next tab setting
e. press whenever you have finished entering information
f. allows you to print all capital letters on the IIe and IIc
g. shows where the next character will be
h. hold the key down to type the symbol that appears on the top half of a key
i. press to stop a program
j. symbol and key for the zero
k. moves the cursor horizontally

You have now completed Unit I: Introduction to the Computer, and are ready to work on Unit II: Computer-Assisted Instruction.

UNIT: II

COMPUTER-ASSISTED INSTRUCTIONS

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UNIT II: COMPUTER-ASSISTED INSTRUCTIONS

This unit addresses the classroom applications of the microcomputer. Topics include Computer-Assisted Instruction, tips for classroom usage, software evaluation, and databank information retrieval systems. Another classroom application, word processing (using the computer as a writing tool), will be discussed in Unit IV.

Unit Objectives:

1. The educator will describe the ways the computer can be used in teaching and learning.
2. The educator will use evaluative criteria to select software that matches goals and objectives established in the school curriculum.
3. The educator will choose the computer as a teaching tool when it improves or enhances instruction and then design lesson plans that effectively integrate the computer into an instructional unit.
4. The educator will identify electronic databases as information sources.

Unit Requirements:

- Read the entire unit and complete Activities 1-3 (1-1/2 hours).
- Scan the software manuals of the three programs you wish to preview (1/2 hour).
- Attend the two-hour class session to preview three software packages and to evaluate one of the packages (you may elect to attend one hour of class to preview software, and then spend at least one additional hour to evaluate a program).

I. COMPUTER-ASSISTED INSTRUCTION

Microcomputers have found their way into most elementary and secondary schools across the nation, with one of the most popular applications being CAI. Computer-Assisted Instruction has been around for nearly twenty years, but until the recent proliferation of microcomputers in schools, it has been confined to research centers and a limited number of large metropolitan school districts. To confuse things, over the years CAI has been called several other things - CAL (Computer-Assisted Learning), CBT (Computer-Based Training), CBI (Computer-Based Instruction), and though somewhat different, CMI (Computer-Managed Instruction) - all having to do with computers and instruction. In general, CAI may be defined as when a student sits at a computer and goes through a previously designed instructional interaction with the computer. Several keywords in the definition deserve further mention:

"computer" -- the student is using a computer throughout the session
"previously designed" -- the student is not programming the computer; the computer is instructing the student
"instructional" -- the program being used is educationally relevant
"interaction" -- the computer responds in various ways to the student's answers

The three most common types of CAI are drill and practice, tutorial, and simulation programs. A brief description of each, with advantages and disadvantages, follows:

A. DRILL & PRACTICE PROGRAMS

- used to review a concept or skill that has already been learned (e.g. multiplication tables).
- the program may "remember" problem areas for student.
- the program may "keep score".
- the program branches to a more appropriate level, based on previous student responses, when necessary.

ADVANTAGE: provides review for students
DISADVANTAGE: its effectiveness is limited to skills learned by rote

B. TUTORIAL PROGRAMS

- the computer behaves as an intelligent tutor, i.e.; the computer presents 1 or 2 screens of information, questions the student, and provides remediation when needed.
- through interaction with the student, individual differences can be addressed.
- can discriminate between classes of wrong answers.

ADVANTAGE: provides remediation and enrichment
DISADVANTAGES: difficult to develop, few quality programs, often demands much time

C. SIMULATION PROGRAMS

- a computerized model of a real or artificial system is presented.
- Features:

1. time compression - enables user to experience a simulated event, e.g., the ecology of a lake.
2. time expansion - enables user to visualize the occurence of an event, e.g., a nuclear reaction.
3. expense avoidance - saves money, e.g., training pilots with simulations vs. planes.
4. danger avoidance - e.g., training for emergency medical procedures
5. feedback - gives feedback sometimes not found in the "real" world

ADVANTAGES: good for teaching broad concepts or principles, fun, motivating
DISADVANTAGES: very difficult to develop, few quality programs

D. COMPUTER GAMES: A fourth category of CAI?

Space Invaders, Pac Man, Donkey Kong - the list of computer games seems endless. There has been a growing interest among physicians, psychologists, educators and parents regarding the impact of computer games on children. Reports of children and young people becoming "addicted" to the flashing lights, rapid pace, reinforcement, and challenge of video games have been widely publicized. Do computer games have a viable role as "reinforcement" or as an "introduction to computers" in public education, or do we risk turning our schools into a nationwide arcade? At what point does a motivating, reinforcing educational computer program become a computer game?

Educational purpose is the key to answering this question. In some cases it may be advantageous to use a computer program written in a game format that drills students on spelling and vocabulary words or math facts. It is important, however, that the 'game' does not overshadow the educational intent of the program. For example, in Milliken's "GULP!" the student must answer addition or multiplication math facts problems to keep the shark from eating the little fish. The program is very motivating and students must quickly and accurately answer the problems for the game to continue. The program and others like it, may be used appropriately as reinforcement for improved student behavior or academic achievement. But students should not be "assigned" to the programs as a regular component of their computer usage in the classroom.

Computer programs such as Plato "Darts" are often referred to as games; however, in these cases the activity centers on the mathematics involved instead of an arcade format. In "Darts" students "explore the placement of relational numbers on the number line." Darts are released by the student to land on a particular point of the number line, with the goal of hitting a balloon tied to the number line. Fractions, decimals, mixed numbers or expressions are allowed as input. The visual feedback of the dart is more valuable to the student than any verbal message could be - accurate, reinforcing feedback for an important mathematical concept.

As a component of a district-wide CAI program, educational computer games are best used as a supplement to other CAI software. Computer games that lack educational relevance do not belong in public schools. Whenever "games" are listed as a category of CAI in a Bath County school library this means educational games, and not PAC MAN, etc.

ACTIVITY I:

A. Write a brief student-teacher contract that rewards a student with 10 minutes of an educational computer game for achieving a specific task.

SUMMARY OF CAI RESEARCH

There has been a significant amount of research over the last several years considering the utility of CAI. In short, CAI has repeatedly been shown as an effective supplement to classroom instruction, with increases in achievement and attitude toward school subjects having been cited. Other consistent findings include:

- positive results found with children having learning problems.
- improves speed of learning.
- improves short and long term retention of learned material.
- increased CAI time produces greater gains.
- more positive results in math than reading.
- gains are equivalent to equal amounts (in minutes) of tutoring.

COMPUTER MANAGED INSTRUCTION

Computer-Managed Instruction (CMI) has a slightly different focus than CAI - the student does not have to use the computer for instruction, although he/she may do so. For example, a student may take a test using the computer and the results would be used to help manage instructions. Likewise, descriptive information about student's academic skills could be entered into a computer and the computer would prescribe lesson plans that match the student's needs. CMI system can score worksheets, keep progress charts, produce individual and group reports, manage educational resources and monitor the success of curriculum materials. Some software packages (e.g., Milliken) consists of both CMI and CAI.

(continued on page 10)

Microcomputers and School Effectiveness

George G. Bear

Evidence abounds that microcomputers will play an influential role in education during the 1980s. They have entered classrooms at an amazing rate. The growth has been augmented by the belief among both educators and the general public that microcomputers will improve the instructional effectiveness of schools. As reported by *Time* Magazine in the January 3, 1983 issue, which awarded the personal computer the distinction of being "The Man of the Year," 68 percent of registered voters feel that the microcomputer will improve the quality of their children's education. This surge in the popularity of microcomputers has pressured many schools into joining the microcomputer bandwagon before asking whether or not such a decision will improve the overall educational effectiveness of their schools.

It is important to note that unlike some other educational movements, the microcomputer bandwagon has not evolved from within the field of education itself. For the most part, the advocacy of microcomputers in education has come not from college trainers or from educators in the field. Nor has it originated as a response to research documenting its effectiveness. This is evident by the fact that we have few educators trained to use the technology and little research supporting its cost-effective utility. Instead, the pressure on schools to implement microcomputer projects can largely be attributed to the highly successful mass marketing strategies employed by the manufacturers of hardware and software. As noted by Chandler (1983, p. 54), "The hardware and much of the software is being produced by business, for business, as a business. Some software is being created by educators, but already many of the programs for schools are being pumped out by the same uninspired group of educational materials authors who are stabled in all of the big publishing companies." Attractiveness and production immediacy have been the major priorities of the computer business. Unfortunately, the educational effec-

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tiveness of hardware and software has received little attention from both manufacturers and purchasers.

Computer Effectiveness and School Effectiveness

It is ironic that an apparent lack of concern among educators and research supporting the effective usage of microcomputers in improving learning is occurring at the same time that the field of education is emphasizing studies of "School Effectiveness" and "Teacher Effectiveness." Robert Ebel, professor emeritus of education at Michigan State University, gives a prime reason why such an irony may exist. Ebel notes that schools rarely examine the results of their programs, but instead focus on the attractiveness of the process. As stated by Ebel (1982, p. 375), "The prevailing assumption is that if the process looks good, the product will also be good. This is a dangerous assumption. Education dollars should not be spent to buy promises." Although Ebel did not refer to the microcomputer movement *per se*, his remarks are quite fitting, as is his proposed solution for the problem: "No instructional program should be undertaken or continued in the absence of evidence of its effectiveness in producing learning."

Educators who deny that they are making the mistake of purchasing microcomputers because they "ought" to be effective in improving their schools often cite research conducted over the past two decades showing CAI, computer-assisted instruction, to be effective in improving student learning. Indeed, there is substantial evidence that CAI is effective (Kulik, Bangert, and Williams, 1983; Ragosta, Holland, and Jamison, 1982). However, in advancing this argument a critical mistake is being made in that such research may not generalize to the use of CAI with microcomputers in the typical school environment having one computer per 50 or more students. Making such a generalization is analogous to a researcher concluding that books improve schools, which would be no great revelation and a finding influenced by literally hundreds of confounding variables, many of which also affect CAI. The truth is that we have been sold on the *process* and not the *product* of microcomputer instruction, and few of us actually *know* if microcomputers are having any worthwhile impact on the effectiveness of schools in improving learning.

Since we have purchased thousands of microcomputers but do not know if they are helping to improve our schools, what should be done? First, each school district should heed Ebel's advice and systematically examine whether or not CAI is having any significant impact on student learning. If it is not, then radical program changes should be made immediately. Second, until we do learn what key factors contribute to the successful integration of CAI with microcomputers at the school level, one would be wise to apply what we already know about school and teacher effectiveness to the usage of microcomputers. It is likely that future research will find CAI to be effective in those classrooms that are characterized by the *same elements of instruction that previous research has shown to be associated with effective teachers.*

Characteristics of Effective Teachers (and Effective Use of Computers!)

What are the characteristics of effective teachers that may generalize to microcomputer instruction? Brophy (1982) presented a concise summary review of eight such characteristics. These characteristics will be used here as a framework for examining the elements of CAI programs that should be related to success or failure. Additionally, we will draw from both formal and informal research that we have conducted in our school district over the past year. Our federally-funded Title IV-C project, "Providing for Success," was implemented in eight fourth- and fifth-grade classrooms using CAI combined with inservice teacher training to improve student attitudes and school achievement (Lancaster, Bear, and Walters, 1983). The program has been a success as evidenced by average gains of 19 percentile points in student attitudes toward mathematics on the Estes Attitude Scales and significant differences between CAI and non-CAI classes on math exams (CAI classes scored an average of 13 points higher than non-CAI classes).

Student Opportunity to Learn

Brophy found that effective teachers allocate more time for academic tasks than do ineffective teachers. The same may be found to be true regarding the effective usage of microcomputers, i.e., more academic gains will be achieved in those classrooms where students have the greatest opportunity to use the computer. However, having a high student computer ratio will not be sufficient *unless the computers are being used*. A school having five computers per class is no better off than a school with one per class, if the former only uses them during math class while the latter uses their machines throughout the day (including before and after school). Whereas "academic learning time" has been found to be a critical factor, so may "academic computing time." Likewise, more computer time will be needed in certain subject areas than in others before gains occur. While 20 minutes of CAI weekly may improve math computation

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scores (as we have found in our project), the same amount of time may have negligible effects on improving work in reading or language arts.

Curriculum Pacing

The amount of CAI time a student spends using the computer should be of less concern to the educator than what the student is actually *doing* during CAI. As noted by Brophy, "variety and a degree of challenge help to motivate learning, but the key variable seems to be the match between students' present achievement levels and the difficulty levels of their assigned tasks."[4] Here lies the educator's greatest challenge of all—selecting software that has the best instructional design. Unfortunately, there is a lot of "garbage" on the market, but excellent software is also available or can be designed by experienced educational programmers within one's school district. If quality standards for the evaluation of software are used during the selection or development process (see Cohen, 1983, for evaluation criteria), then the software should allow students to work at appropriate difficulty levels with high rates of success (90 to 100 percent), a variable that Brophy cited as being critical to learning. The teacher, with the possible assistance of software with management programs, must continuously monitor student performance and emphasize individualized instruction and self-pacing. The effectiveness of using microcomputers will be limited whenever class assignments are made without consideration of individual differences. In addition to selecting software with high standards of quality, it is also critical that what is being taught, via the selected software, matches or aligns with the objectives of the local curriculum and with the tests used in evaluating the program. If this is not done, whatever is learned may go undetected.

We achieved curriculum alignment by employing teachers during the summer to evaluate and match commercial software with the local curriculum. Only aligned software was made available to teachers during the school year. Educational games were used only if their content also matched the curriculum (e.g., "Mastertype" lessons were programmed with spelling words) and providing that the students "earned" the privilege to play by completing a written teacher/student contract. Curriculum pacing was accomplished by having teachers and project consultants routinely examine computer printouts of student progress.

Teaching to Mastery

Students who experience high success rates do so because their teachers provide frequent drill-and-practice, monitor each student's individual progress, and provide feedback and remedial instructions when needed. In effective schools, basic skills are practiced to the point that over-learning occurs and higher-level objectives are not emphasized unless the lower-level objectives have already been mastered and over-learned. Undoubtedly, generalizing this finding to microcomputer applications will bother some educators, especially those who believe that using microcomputers for drill-and-practice is a gross misuse of a powerful learning device. Nevertheless, although research has already documented the value of CAI for drill-and-practice, the verdict is not yet in on using computers to improve higher-level objectives. Since microcomputers, with quality software, can provide the reinforcement, monitoring, branching, feedback, and remedial instructions characteristic of effective teaching, it is likely that schools employing them primarily for the drill-and-practice of basic skills will be more successful in improving overall school effectiveness, as commonly measured in the literature by standardized achievement tests. Although worthwhile goals may be achieved in schools that emphasize computer literacy and the learning of computer languages (the most common being BASIC and LOGO), gains, if any, on standardized achievement tests given in such schools will be less impressive and perhaps only found on math tests when higher-level math skills are measured in high school.

Besides possible achievement gains, another reason why we chose to emphasize CAI (we also provide computer literacy and programming courses) was because we found that CAI is much easier to "sell" to computer-leary teachers.

Classroom Management and Organization

The importance of having students maximally engaged in academic activities that are of appropriate levels of difficulty and aligned with the local curriculum cannot be overemphasized. In order for appropriate "academic learning time" to be maximized, efficient learning environments and group management procedures must be characteristic of the classroom. This means that physical arrangements for microcomputers must be conducive to learning and not distracting to others in the classroom. Students should be skilled in operating the computer and know exactly what software to use. The need for teacher assistance should be minimal. A scheduling system should be employed that maximizes computer usage and minimizes classroom disruptions. After trying several scheduling methods with computers located within the classroom, we have found that the use of 15-minute sessions (an "egg timer" is used), with the predetermined order of student usage based on

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seating assignment, worked most efficiently. Instead of requiring each student to remember a specific time to work on the computer or asking the teacher to have students use the computer "whenever convenient" (which in some classes resulted in 30 minutes daily per class), each student is simply told to use the computer for 15 minutes immediately after the previous user returns to his or her seat. As such, the microcomputer experiences continual usage, except whenever the teacher requires the attention of the entire class.

Student progress should be closely monitored, preferably by both the microcomputer and the teacher, but never by the computer alone over lengthy periods of time. Software with a management system that monitors student progress can be a valuable asset, but may also encourage a false sense of instructional confidence on the part of teachers. This is seen when a teacher, usually one without inservice training, turns class teaching and management of a subject area over to the computer, allowing a student to waste time working on objectives that have already been mastered or not yet taught. Few software programs presently on the market provide instructions and practice necessary to meet the needs of all students in the classroom over any extended period of time. Microcomputers can assist teachers with classroom management and instructions, but only when the computers themselves are managed effectively.

Active Teaching

Research shows that in effective classrooms the teacher does not expect students to master their assignments on their own. Skills in the curriculum are actively taught by the teacher before independent drill-and-practice is provided. Although microcomputers can offer active instructions through tutorials, few tutorial programs exist, and there is no research demonstrating that such tutorials can do a better job than the classroom teacher in teaching a new concept. On the other hand, the reactive nature of most CAI programs that we have reviewed provides the type of drill-and-practice that needs to follow active classroom teaching in order for a concept to be mastered. As such, microcomputers can improve school effectiveness best when used to *supplement* effective management and instruction. Only under optimal conditions (conditions that do not typify the current state of the art) can a microcomputer teach a curriculum unit to students as effectively as teachers who provide direct instruction. And even when ideal conditions do exist, some students may actually object to the highly reactive and structured nature of CAI programs (Kulik, 1981).

Most educators who have used microcomputers in their classrooms are aware of their limitations and advantages; however, other novice educators may fall victim to false expectations—false expectations encouraged by "bandwagon" mania and misleading advertisements (e.g., "proven to significantly increase skills performance—in some cases by three times!"). Educators expecting to remediate the reading problems of slow learners or to challenge the gifted with advanced software programs by simply placing a microcomputer in the classroom will quickly learn that microcomputers cannot fill this role.

Grade-Level Differences

Brophy notes that the above five principles for teacher effectiveness must be viewed within the context of the needs of students at different grade levels. This should also hold true when these principles are applied to microcomputer usage. Of obvious importance is the consideration of student differences in the selection or design of instructional software. The use of common sense and systematic evaluation criteria should help ensure software appropriateness. Material that is motivational and successful with primary students may not be appropriate for secondary students, even if they do need the same skills for remedial purposes. Having a fire-breathing dragon blowing smoke rings on the screen with a message "Good, Johnny" will not impress too many 18-year-olds! The management of microcomputers should also reflect grade-level differences. Although younger students may be able to work as independently on the microcomputer as older students whenever basic skills are being practiced, more guidance may be necessary when the microcomputer is used for simulations, tutorials, or programming. However, even when appropriate software and management are used, educators should not expect CAI to be as successful with secondary students as with elementary students (Kulik, Bangert, and Williams, 1983). Thus, it is clear that the selection of software and hardware and decisions regarding the capacity in which they will be used must be based on a consideration of student differences.

Teacher Expectations, Role Definitions, and Sense of Efficacy

Effective teachers truly believe that every student is capable of learning the material presented, and they adapt their strategies and models of teaching when necessary to ensure that their students do learn. Similarly, teachers using micro-

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computers must feel comfortable with their usage and expect that microcomputers will improve learning. They need to be computer-literate in the sense that although they may not have programming skills, they do understand the role of microcomputers in education and society, and know how to use microcomputers effectively. Microcomputer usage may include CAI, tutorials, simulations, "arcademic" games, classroom management, problem-solving, programming, or a combination thereof; depending on the objectives and needs of the classroom and the suitability of the software. Motivational aspects of the microcomputer should be fully utilized.

Inservice and ongoing supervision is critical in order to overcome the two most common problems identified by teachers as limiting their expectations and sense of efficacy: (1) the lack of adequate training and (2) misunderstandings about the capabilities of computers (Ragosta, Holland, and Jamison, 1982). This became clear to us when the evaluation of our CAI project revealed higher math scores and gains in student attitudes only in those classrooms where the teachers (six of eight) completed a three-semester-hour college course on motivation and microcomputers. *Placing a microcomputer into the classrooms of teachers without inservice training was ineffective*, even though consultative assistance was available. The teachers without inservice training either never asked for assistance or became totally dependent upon it. In both cases, these teachers did not demonstrate the commitment shown by the trained teachers.

Supportive Learning Environment

Providing an environment in which students would be motivated to learn was the primary goal of our project. Although CAI was designed to be the primary component of the project, we felt that in order for CAI to be effective it had to be implemented in an environment conducive to learning. As described by Brophy, students perceive such an environment as being friendly and the teachers as being enthusiastic and supportive. The inservice program that we offered emphasized the use of CAI as a motivational tool and provided teachers with training in principles of classroom management, motivation, and student responsibility. Ongoing supervision, mainly from the CAI project director and coordinator, was also routinely provided. Without inservice training and supervision that addressed both CAI and the learning environment, the project may have failed, as it did in the two previously-mentioned classrooms where the teachers did not participate in inservice training.

Conclusion

It remains to be determined whether or not these eight characteristics of effective schools identified by Brophy will also be found to be associated with the successful implementation of CAI. Undoubtedly, other characteristics will also emerge, and because of the multitude of variables impinging upon the implementation of CAI programs, research may reveal that not all successful CAI programs share the same characteristics. Until such research does materialize, educators would be wise to use common sense and apply the knowledge that we already have obtained from the study of effective schools. ☐

References

Brophy, J.E. Successful Teaching Strategies for the Inner-City Child. *Phi Delta Kappan*, April 1982, 527-529.

Chandler, H.N. If We're Really on Our Way Shouldn't We Buy a Roadmap? *Journal of Learning Disabilities*, 1983, *16*, 54-56.

Cohen, V.B. Criteria for the Evaluation of Microcomputer Courseware. *Educational Technology*, January 1983, 9-14.

Ebel, R.L. Three Radical Proposals for Strengthening Education. *Phi Delta Kappan*, February 1982, 375-380.

Kulik, J.A. Integrating Findings From Different Levels of Instruction. Paper presented at the American Educational Research Association, Los Angeles, April 1981. (ERIC Document Reproduction Service No. ED 208 040)

Kulik, J.R., Bangert, R.L., and Williams, G.W. Effects of Computer-Based Teaching on Secondary School Students. *Journal of Educational Psychology*, 1983, *75*, 19-26.

Lancaster, P., Bear, G., and Walters, M. Using Microcomputers to Improve School Attitudes. Paper presented at the Convention of the National Association of School Psychologists, March 1983.

Ragosta, M., Holland, P.W., and Jamison, D.J. *Computer-Assisted Instruction and Compensatory Education: The ETS/LAUSD Study. Project Report Number 20.* Princeton, NJ: Educational Testing Service, June 1982.

VERY interesting . . .

Where did you read that?

Why, ED TECH, of course!

Educational Technology the world's preeminent magazine of educational media and technology.

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Read the article "Microcomputers and School Effectiveness" (pages 5-9) and then complete Activity 1 based on the above information and the article.

ACTIVITY II:

a. Define CAI. ____
____
____
____
____

b. What are the three most common types of CAI?
____
____
____

c. List the eight characteristics of effective teachers that may be generalized to microcomputer instructions.
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II. SOFTWARE EVALUATION

A. EVALUATION FORM

The software evaluation form on page 11 provides structure to the review and assessment of microcomputer software being considered for inclusion in Bath County's software library. The sections labeled Content, Method, and Technical comprise those characteristics generally accepted as being critical in the development of good software. Analysis of the twenty items within the scale will underscore the significance of each category. Judgments should be based on the thorough investigation of the program and support materials in the package. Descriptive information at the top of the sheet should be entered when known.

Items 1 through 20 are to be rated on the scale provided. "NA" (Not Applicable) should be circled in cases when an item may be meaningless for the program being evaluated.

You will need to use this form to complete Activity 3 (In-Class Session).

B. CLASSROOM ASSIGNMENTS

Three main types of information are required to evaluate the effectiveness of CAI in the classroom:

BATH COUNTY PUBLIC SCHOOLS Software Evaluation

Program Title: ______________________ Publisher: ______________________

Subject Area: ______________________ Grade Level(s): ______________________

Student Records Management? ______________ Back Up Provided? ______________

Reviewer's Name: ______________________ Date of Review: ______________

Check One:
- Drill & Practice ___
- Tutorial ___
- Simulation ___
- Programming ___
- Other ___

1 = Poor 2 = Fair 3 = Good 4 = Superior NA = Not Applicable

CONTENT	1 2 3 4	NA	1. Content is accurate and objective
	1 2 3 4	NA	2. Content has educational value
	1 2 3 4	NA	3. Content is presented in a logical sequence
	1 2 3 4	NA	4. Content supports BCPS curricula
METHOD	1 2 3 4	NA	5. Program objectives are defined and met
	1 2 3 4	NA	6. Instructional level is appropriate for target audience
	1 2 3 4	NA	7. Program branches based on previous user responses
	1 2 3 4	NA	8. User instructions are clearly stated
	1 2 3 4	NA	9. Effective feedback is given to user responses
	1 2 3 4	NA	10. Program is motivating
	1 2 3 4	NA	11. Graphics, color & sound enhance instructional quality
	1 2 3 4	NA	12. Program effectively uses examples and demonstrations
TECHNICAL	1 2 3 4	NA	13. User can independently use program
	1 2 3 4	NA	14. User may exit program at points in learning sequence
	1 2 3 4	NA	15. Instructor can modify program sequence
	1 2 3 4	NA	16. Program is reliable and error-free
	1 2 3 4	NA	17. Reading level is appropriate for target audience
	1 2 3 4	NA	18. User time is well-spent
	1 2 3 4	NA	19. Program documentation is comprehensive
	1 2 3 4	NA	20. Program appropriately uses computer capabilities
	1 2 3 4	NA	21. Program content may be modified to meet needs

General Rating (check only one)

- ___ I strongly recommend purchase of this program for Bath schools
- ___ This program may effectively supplement our software library
- ___ To a very small degree, this program may be useful
- ___ I do not recommend purchase of this program for Bath schools

Program Strengths

Program Weaknesses

Potential Use of Program

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1. what programs are being used.
2. what curriculum objectives are being addressed.
3. how much time students are using the program.

The Objective Assignment Sheet (page 13) was created to meet this need and is to be used by all teachers using CAI in Bath County. Steps to complete the sheet are listed below:

1. enter your grade level and six-week period.
2. enter the curriculum objective and number.
3. the "Sheet #" may be helpful if you have different students working on different objectives or programs.
4. the computer program you are using should be entered under "ASSIGNMENTS". List the title, publisher, and problem level or specific assignments.
5. Enter Student Names - you may want to do this step first and then copy the sheet to avoid rewriting student names each six weeks.
6. Students are to mark a "✓" in a "SESSIONS COMPLETED" box each time they complete a 10 minute session. Sessions may range from 10 to 15 minutes, though not less than 10 minutes.

It is vital for evaluation purposes that the Objective Assignment Sheet is completed and returned each six weeks. It is probable that more than one program (and thus more than one sheet) will be used each six weeks, though not more than three programs should be used by a group of students in one marking period.

*** Students are likely to make greater gains if they work with the same CAI program for at least six sessions before changing programs. ***

A sample Objective Assignment Sheet is shown below:

OBJECTIVE ASSIGNMENT SHEET
Curriculum Objective: Math Oper. #23.2
Grade: 2
6-Weeks: 3
Sheet #: 1

#	NAME	SESSIONS COMPLETED							ASSIGNMENTS
1	George Bear	✓	✓	✓					Milliken Addition Sequences PL 7-23
2	Paul Lancaster	✓	✓	✓	✓	✓			
3	Joan Thomas	✓	✓	✓	✓				
4	Sue Hirsh	✓	✓						
5	Roger Davis	✓	✓	✓	✓				
6	Beth Hart	✓	✓						
7	Ellie Collins	✓	✓	✓	✓	✓			
8	Kay Hicklin	✓	✓	✓					
9	Laurel Praet	✓	✓						
10	Carol Phillips	✓	✓						

OBJECTIVE ASSIGNMENT SHEET

Grade__________

Curriculum Objective________________________ #_______

Six Weeks________

Sheet #_______

#	NAME	SESSIONS COMPLETED																				ASSIGNMENTS
1																						
2																						
3																						
4																						
5																						
6																						
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III. CLASSROOM MANAGEMENT TIPS

A. HARDWARE

The following tips are an attempt to answer potential questions you may have regarding classroom computer usage. The tips may later be a useful reference.

- Place the computer away from windows (or pull the shade).
  - reduces glare
  - usually keeps it away from heating unit
  - reduces visibility from outside
- Make sure that all computer hardware is plugged into the System Saver box (when available) on the left side of the computer. If the computer has a System Saver all hardware should be left ON, except for the System Saver switch, when the computer is not in use.
- Computers on Carts: Be CAREFUL with the monitors - they may fall if bumped hard enough!
- Do not use computers during thunderstorms.
- System Savers should NOT share an outlet with other electrical equipment through the use of multiple outlet extensions.
- If hardware must be moved, make sure of the following:
  - unplug System Saver cord from wall outlet.
  - remove monitor cable from back of monitor - not video jack on computer.
  - disconnect printer cable from printer.
  - place disk drive on computer.
  - grasp computer from the back of the machine (this will help keep the drive from sliding).
- Do not touch monitor screen, except to dust with soft cloth.
- Leave disk drive door open when computer is not in use.
- Do not strike keys with too much force - especially space bar and return key.
- Do not adjust switches on monitor, printer or computer; use the System Saver switch ONLY.

B. SOFTWARE

- Review a Bath County Software Catalog (page 15) for programs that are suitable for your class.
- Always refer to the manual accompanying the software, especially when you are using the software for the first time.
- Each package (software and manual) is coded for checkout and identification purposes. For example, M002a is the code for Milliken Addition (copy a). An explanation of the five character code follows:

  1st character: Subject Area

categories:	M	Math
	L	Language Arts
	R	Reading
	S	Science/Social Studies
	A	Additional
	P	Programming
	T	Teacher Utility

Bath County Public Schools Recommended SOFTWARE LIST for COMPUTER OVERVIEW INSERVICE

DRILL & PRACTICE

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Code #	Title	Location
M001-M012	Milliken Math Sequence	V, M, HS
M016	Math Word Games	V, M
M022	Geometry & Measurement	HS
L001 & L002	Homonyms I	V, M, HS
L003 & L004	Pronouns I	V, M
L005 & L006	Verbs I	V, M, HS
L007 & L008	Sentence Combining 1-10, 11-18	V, M
L009-L016	Word Structure A-H	V, M, HS
L028 & L029	Punctuation	M
L030 & L031	Combining Sentences & Creating Complex Sentences	M
R001-R024	Reading Comprehension	V, M
R025-R031	Diascriptive Reading	HS
R032	Customized Alphabet Drill	V, M
R033	CARIS	V, M

SIMULATION

M020	MECC Elementary Volume 4 ODELL LAKE - ODELL WOODS - SOLAR DISTANCE - URSA	M
S001	MECC Elementary Volume 3 SELL APPLES - SELL PLANTS - SELL LEMONADE - SELL BICYCLES	V, M
S004	MECC Elementary Vol. 6 Social Studies FURS OREGON SUMER VOYAGEUR	V
S005	MECC Science Volume 3 (middle school) FISH - ODELL LAKE - URSA - QUAKES	V
	Apple Simulations NUCLEAR POWER PLANT SIMULATION LEMONADE STAND SIMULATION STOCK MARKET SIMULATION	V, M, HS
S007	Operation Frog	V, M

EDUCATIONAL GAMES

M013	MECC Elementary Volume 1 BAGELS - HURKLE - METRIC 21 - NUMBER - TAXMAN	V, M
M014	Gulp!/Arrow Graphics	V, M
M015	Frenzy/Flip Flop	V, M
M016	Battling Bugs/Concentration	V, M
M018	Dragon Mix	V, M
M019	Dueling Digits	M
M020	MECC ELEMENTARY Volume 4 - MATH GAME	M
M021	MECC Volume 1 Senior High BAGELS - SNARK - ICBN - RADAR	HS
M024	Plato Fractions	V, M
L018	Mastertype	V, M
L019	Magic Spells	V, M
L026	Sticky Bear ABC	V, M
L027	Spellicopter	M
A002	Moptown	V, M
A003	Plot/Guess the Rule	HS
A004	Isac Newton	HS
A007	Rocky's Boots	V, M
A008	Snooper Troops #1	V
A013	Snooper Troops #2	M

2nd, 3rd & 4th characters: Sequence Number in subject area

example: M001 Milliken Number Readiness
M002 Milliken Addition
M003 Milliken Subtraction
M004 Milliken Multiplication
etc.
P001 Apple Logo
P002 Handholding BASIC
P003 Step By Step

5th character: Copy (purpose is to distinguish multiple copies of programs)

example: M002a BCHS copy of Addition program
M002b VES copy of Addition program

- Make sure students hold diskettes by the label only.
- Often the sound in a computer program may be turned off. Do so if the noise disrupts the class.
- Our drill and practice, tutorial, and simulation programs are usually very motivating. Educational games are available to use as a supplement to the other programs, especially as a contingency for academic or behavioral improvement. A game should be returned to the media center after use, because a whole class will rarely, if ever, use it as a primary program, and because we have only a few in the schools.
- If you have a problem with the computer, consult the program manual. THEN talk it over with one of the computer coordinators in your school.
- Present your software needs to one of the computer coordinators in your school. We may be able to purchase an appropriate program.
- When using a program...
  - -- press RETURN when unsure of what to do next.
  - -- press ESC (Escape) in Milliken and some other programs when finished. Then wait if the red disk drive light is on.
- Students are likely to make greater gains if they work on the SAME CAI program for at least six sessions before changing programs.
- Monitor student progress every week or two:
  - -- check objective assignment sheet.
  - -- review student progress through the program management system (when available).
  - -- obtain printouts of progress and keep them with student papers or send them home with students.
- Observation of the objective assignment sheet will let you know which students are not using the computer. Try to give such students some extra time.
- Printers are available for reports of student progress (in some programs) -- use them!
- Turn in objective assignment sheets at the end of each six weeks and give them to one of the computer coordinators in your school.
- Keep the computers busy whenever possible. There are times when it is necessary to have all the students' attention. "Computer Time" may be:
  - -- before classes begin in the morning.
  - -- during "free" time.
  - -- during individual seat work.

-- during "centers".
-- during the time you typically do that subject.
-- during the time you typically do another subject!
-- after school (when available).

- Introduce a CAI program to the class as a group before students use the program. This will save many questions later.
- Make specific assignments for the class when possible.
  example: Milliken Subtraction, problem levels 13-31, 37-42
  Instead of problem levels 1-56
  Refer to manual for listing of lesson objectives.
- One successful method to determine sequencing of students to the computer is that the class list on the objective assignment sheet is ordered alphabetically, by rows, by groups, etc.. When leaving the computer the student tells the next student.
- Computer sessions should last 10-15 minutes. Bell timers may be helpful. Several were purchased last year; those and others may be floating around the school.
- For primary students, have one password for all students (when passwords are required). The fewer the characters the better.

Be sure to remind your students:

- "Check in" on the log form BEFORE starting.
- Handle diskettes by label ONLY.
- Do not bend diskettes.
- Do not place diskettes on disk drive or monitor.
- Keep hands away from keyboard when disk drive light is on.
- Wait until disk drive light if OFF before removing a diskette.
- Return each diskette to its sleeve when finished, and place the diskettes in a storage box.
- Tell the teacher if you have any problems using the computer.

IV. COMPUTER TROUBLESHOORTING GUIDE*

Potential problems during computer usage are dealt with below. Please retain this guide for future references.

*but don't shoot the computer

SLOW DOWN -- many problems can be solved if you:

1. Stop what you are doing.
2. THINK about the problem.
   -- What are you trying to do?
   -- What happened before the problem?
   -- What did the computer do?
   -- What did you do?
3. Turn the computer off/on when having difficulty starting a program.

4. Press RETURN when unsure what to do next.
5. Re-read the directions presented on the monitor.
6. Consult the manual.
7. Ask a computer coordinator in your school.

SYMPTOMS	WHAT TO DO
1. Computer will not start.	- are you trying the correct switch? (System Saver red switch at left of computer.) - push System Saver Switch to "off". System Saver plugged into wall socket?: check all wires/cables in connection; cable to computer inserted snugly? - computer switch ON? (should always be "ON") - ask a computer coordinator.
2. Software will not load just "spins" (red light stays on).	- is the disk drive door closed? - is the diskette "right side up"? - press CTRL/RESET, then type: PR#6 and press RETURN. - if no success, then again press CTRL/RESET, and then turn computer off/on once. - ask a computer coordinator.
3. Program seems to have loaded, but no picture on monitor.	- is monitor plugged into System Saver? - is monitor on? - is monitor wire connected to computer monitor? - if monitor is a "TV" (MES), is the TV connector switched to "computer"? On Channel 33-UHF?
4. Keyboard will not work or computer doesn't recognize letters.	- for the Apple IIe/IIc, press CAPs LOCK.

STUDENT USAGE	
1. Time has run out and you're in the middle of a lesson.	- for Milliken and several other programs, answer the immediate question and then press ESC ("Escape") wait for computer to update records and red light to go out, then shut off computer - for BORG-WARNER WORD STRUCTURE, just shut off computer if in middle of lesson and you can't go on - provided red light is out! - for MECC, just shut off computer if red light is out. - if red light is out, shut off computer and ask teacher.

STUDENT USAGE

2. Program stops for some reason (e.g., "Break in 310", "I/O Error").	- shut off computer and re-insert diskette; restart program. - ask the teacher for assistance.

A. DATABANKS

On-line databank services, used by both students and teachers, are a growing application of microcomputers in schools. Using a computer connected by telephone to a databank located perhaps in California, you can access information in minutes that would otherwise require hours to locate in printed indexes and catalogs of a library. The advent of microcomputers coupled with telephone lines has enabled businesses, research centers, public institutions as well as private individuals to search through databanks of large computers hundreds of miles away.

A databank is simply a collection of information. One of the widest used educational databanks is the ERIC (Educational Resources Information Center), which contains approximately 500,000 documents and journal articles. Databanks are typically specialized within a certain discipline or general topic. Presently, Bath County Schools subscribes to the DIALOG information retrieval service. Databanks available through this service that are of interest to educators include:

Name	Subject
ERIC	Education; Library Science
ECER	Special Education
PSYCINFO	Psychology
Dissertation Abstracts	Ph.D. Dissertations
Book Review Index	Book & Periodical Reviews
Books In Print	Book Information
VPI News	Full Text Articles from UPI News Service
... and many others	

A microcomputer system used for database searching must include a printer and telephone modem. The printer's use is straight forward; it would be difficult - and expensive - to copy all information on the monitor screen. The modem is an electronic device connected to both the telephone line and the microcomputer to allow communication between the database and user. For more information about the DIALOG Databank Information Retrieval System see the separate inservice package that has been developed for Bath County teachers.

ACTIVITY III:

1. What are three possible applications of databank services for students and teachers in a rural school system?

____

____

____

B. TWO HOUR CLASS SESSION (please read before class)

The class session is comprised of two activities:

(1) Preview of software packages
(2) Evaluation of one software package.

(1) Software Preview

Using the list of recommended software on page 15, select a software package in each of the following categories:

drill and practice
simulation
educational game

Checkout the documentation and diskettes from the library, and **BRING THESE TO THE CLASS SESSION.** You should look over the program documentation before the class. A computer coordinator will assist you in your preview of the software.

(2) Software Evaluation

You will complete a software evaluation sheet (page 11) for one of the packages you previewed, to assess the educational value of the package. You may be asked to present your findings in class.

Elementary Teachers: You will make a ficticious class assignment, completing an Objective Assessment Sheet for the package you evaluated.

UNIT: III

INTRODUCTION TO PROGRAMMING

(Logo Version)

BEST COPY AVAILABLE

UNIT III: INTRODUCTION TO PROGRAMMING

Now that you have used preprogrammed diskettes to give the computer the instructions necessary to perform a program, it is time to learn how to "talk" directly to your computer to tell it what to do, and without the software telling you how. This will help you to understand how a program is developed. However, this unit is not intended to teach you to write complex programs on your own. As you read and practice the exercises contained in this section you will come to understand the basic principles involved in constructing and writing a computer program.

There are two versions of Part III. Both contain the Introduction to Programming, but then branch off to either the BASIC or Logo programming language. It is recommended that teachers in grades K-5 use the Logo version, and teachers in grades 6-12 use the BASIC version.

Unit Objectives:

Objective 5: The educator will select and use an appropriate program to accomplish a given task. This should include:

a. Analyzing the task;
b. Selecting appropriate software; and
c. Using program documentation to implement software

Objective 6: The educator will describe a computer program. This should include:

a. Explaining the sequential statements;
b. Explaining program commands, e.g. input, print; and
c. Explaining the logical design.

Objective 7: The educator will be given a problem which will require the writing of a simple program. This should include:

a. Defining the logical solutions to the problem,
b. Coding the problem in a programming language;
c. Testing the program;
d. Debugging the program; and
e. Documenting the program.

Unit Requirements: (Total of 4 hours of work)

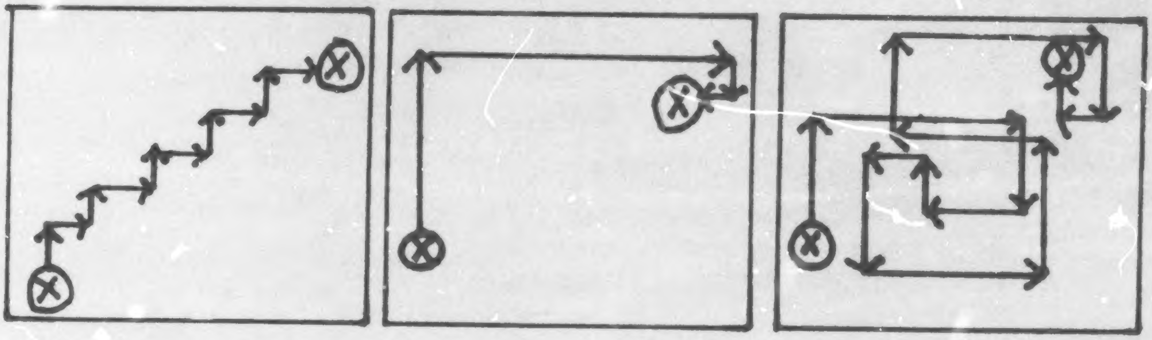
- Read the first eight pages and complete the activities (none require the use of a computer (1 hr.)).
- Participate in the two-hour class session on LOGO or BASIC
- Explore elements of LOGO or BASIC on your own (1 hour)

First and foremost, you must remember that a computer is a TOTALLY OBEDIENT IDIOT WITH A LIMITED VOCABULARY. It will do EXACTLY what you tell it to do - NOTHING MORE and NOTHING LESS - as long as you use words it understands.

Secondly you must understand that computers do not (at this time) solve problems. PEOPLE solve problems. Computers merely implement the solutions developed by the programmer when instructed to do so.

As a very simple example, imagine a room and a child who only understands the words "move, stop, step, forward, backward, right left", and the numbers one through one hundred. You want the child to move from his present location to a spot diagonally across the room. The child cannot see you. How are you going to direct the child if he does not understand the word "diagonally," cannot see you point, but will do anything you tell him to? Figure out how to use the few words the child understands to get him to move where you want.

There is more than one way to work it out, isn't there? Remember this: there is always more than one way to write a program to solve a problem. The important thing is that you arrive at the point where you want to go.



As in Figure A, you could tell the child to move forward one step, move right one step, etc., or forward X number of steps and right X number of steps, as in Figure B, moving him back, or left to correct if he overestimates. You could also let him move randomly and tell him to stop if he accidentally reached your objective, couldn't you? Wouldn't it be nice if you could teach him the word "diagonally?"

This is an example of the process you will use to attack programming problems with a computer. Remember from Unit I that computers only understand machine (or assembly) language. All other languages must first be translated into machine language by the compiler. So, if the company did not tell the computer what "diagonally" means it will not understand "diagonally" when you type it. You would have to create a definition of "diagonally" that uses terms already in the compiler. To create the definition, you would develop a program using BASIC or Logo, or perhaps another computer language, that the compiler understands.

I. WHAT IS A COMPUTER PROGRAM?

A computer program is simply a series of instructions that tells a computer what to do.

When you begin to develop a program, you must:

1. Understand the problem and be able to determine if it can be solved on a computer.
2. Have an idea of what operations your computer is capable of performing.
3. You must decide what you want the program output to be, because that will determine what input the computer needs.

There are five steps involved in the solution of a problem with a computer:

- A. Problem Analysis
- B. Program Design
- C. Coding the Program
- D. Testing the Program
- E. Documentation

Let's take a look at each of these steps.

A. PROBLEM ANALYSIS

Let's take these one at a time. The first step is to define the problem. Although it may sound obvious, frequently it isn't. You must know exactly what the problem is and what results you want before you attempt to solve it. A program to add two numbers together, for instance, would be very simple to design while a program to automate the entire accounting system for a company might include so many variables that it would take months to define all of the components of the problem adequately. Basically, problem analysis has three steps:

- a. Describe clearly the purpose of the proposed program.
- b. Plan carefully what the output should be.
- c. Identify the necessary information (input) the computer needs to produce the output you desire.

For example, let's say you want to create a program to find 4% sales tax on various items:

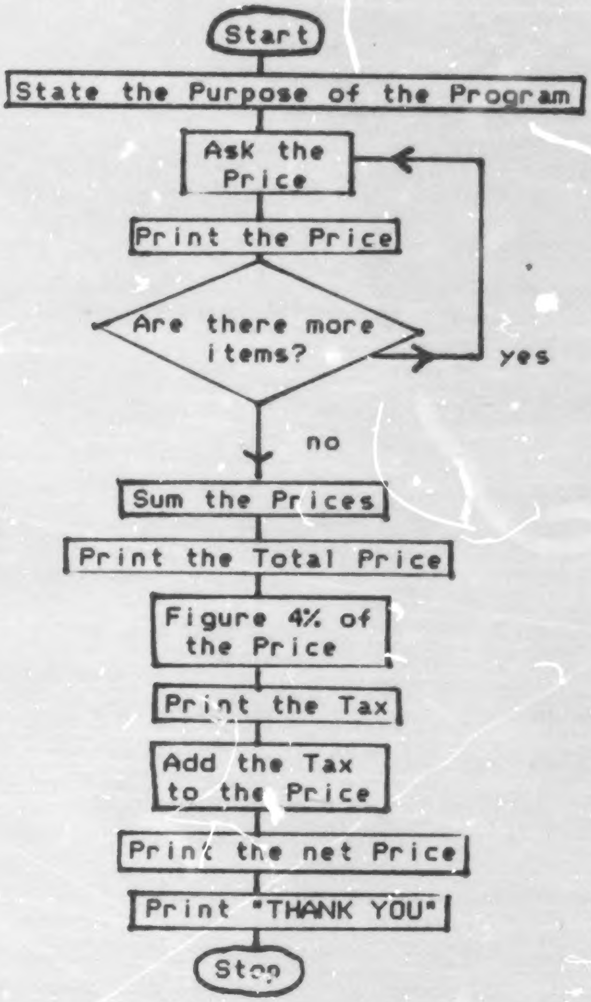
- a. The purpose is to find the amount of tax and the net price on a given item or list of items,
- b. The output should include the amount of tax and the net price, and
- c. The computer needs input consisting of the original price, rate of tax, and commands to figure and print results.

B. PROGRAM DESIGN

After you analyze a problem and understand what you want to do, you need to plan the steps needed to get from the input to the desired output. These steps may be written in brief English-like phrases, or may be pictorially represented by constructing a flowchart. Either system helps the programmer to view the logic used to solve the problem clearly enough to spot logical inconsistencies and contradictions. For example, if you want to set up a program to figure 4% sales tax on various items, your program design might look like this:

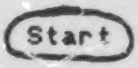
1. Print the purpose of the program. (output)
2. Ask the price of the item. (input)
3. Print the price. (output)
4. Ask if there are more items. (decision)
5. If yes, go back to #2. (process)
6. If no, total the items. (process)
7. Print the total. (output)
8. Figure 4% of the total. (process)
9. Print the tax. (output)
10. Add the tax to the total. (process)
11. Print the net total. (output)
12. Print THANK YOU. (output)

If you constructed a flowchart, it might look like this:


Start
State the Purpose of the Program
Ask the Price
Print the Price
Are there more items?
yes
no
Sum the Prices
Print the Total Price
Figure 4% of the Price
Print the Tax
Add the Tax to the Price
Print the net Price
Print "THANK YOU"
Stop

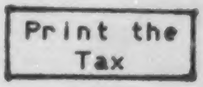
Note the meaning of the shapes used:

OVAL



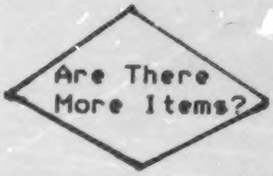
Start/Stop

RECTANGLE


Print the Tax

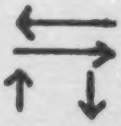
Command to do something: INPUT, OUTPUT, or PROCESS*

DIAMOND


Are There More Items?

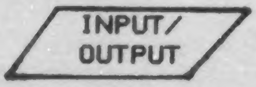
Decision, asks "If..."

ARROWS



Indicates the direction of the flow.

*Note that some texts use a parallelogram to symbolize when data are to be entered into the computer or sent from the computer to another device.


INPUT/
OUTPUT

Basically, there are four kinds of instructions that you need to tell the computer in our program. The same terms - INPUT, PROCESS, and OUTPUT - that are used to describe components of the computer can also be used to describe three kinds of instructions the computer program must include. In addition, you need to tell the computer when to make a DECISION based on previous INPUT data or on additional data that must be obtained. When a DECISION needs to be made, a yes/no question must be answered. Line 4 in the above program design is an example of a DECISION instruction, while the other items are INPUT, PROCESS, or OUTPUT instructions.

Either a written program or a flowchart produces a way of communicating the program logic to others and provides a detailed blueprint to be used in the next step, which is coding the computer program into language the computer can understand. These program designs also serve to divide a large problem into several smaller more manageable segments in a modular system.

C. CODING

The third step in creating a program is to code the program. In this step ou need to put your program design into a series of instructions the computer can understand and manipulate. Using a programming language such as BASIC or Logo, you give the computer specific line-by-line instructions.

D. TESTING THE PROGRAM

Actually you have already been testing some programs as you followed the examples given. The important thing to remember is that your output must be the result you want. If it isn't, you have one or more bugs in your program that you need to debug. Debugging is accomplished by tracing the program step-by-step in order to find your error and correct it.

Your last activity will give you practice in writing, testing and debugging some programs.

E. DOCUMENTATION

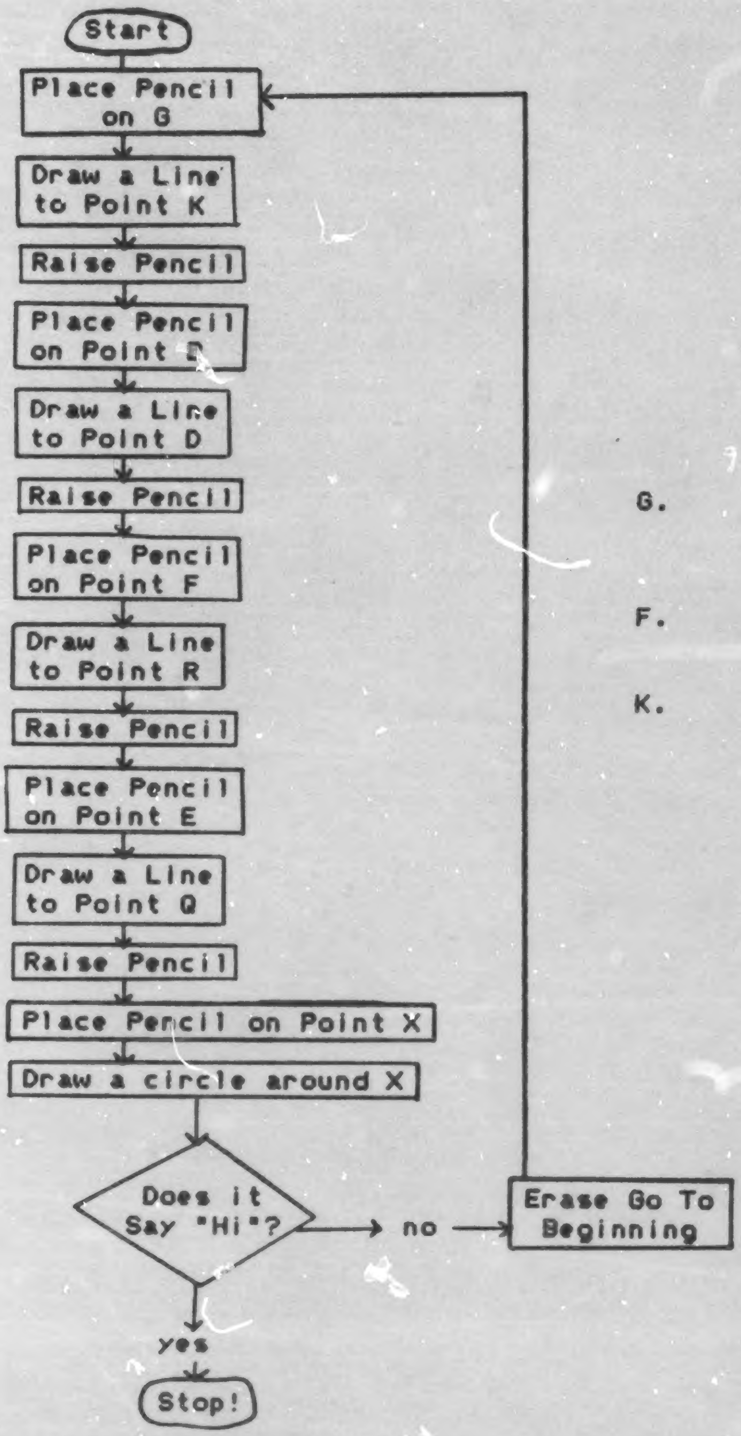
After the program is working, a programmer should put together a set of information to go with it. This information should include:

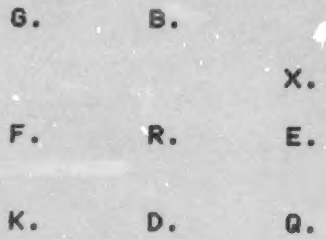
1. A description of the problem
2. A flowchart
3. A listing of the program
4. Any instructions needed to operate the problem
5. A sample run of the program

You should, even though you are a beginner, put at least a REM (Remark) statement (defined later) in your program, stating the purpose of that program, who wrote it, and when it was written. This is especially true when you start saving programs on a diskette or cassette.

ACTIVITY I:

1. Here is another example of a flowchart. See if you can follow the directions:


Start
Place Pencil on G
Draw a Line to Point K
Raise Pencil
Place Pencil on Point B
Draw a Line to Point D
Raise Pencil
Place Pencil on Point F
Draw a Line to Point R
Raise Pencil
Place Pencil on Point E
Draw a Line to Point Q
Raise Pencil
Place Pencil on Point X
Draw a circle around X
Does it Say "Hi"?
no
Erase Go To Beginning
yes
Stop!



2. What programming language is most often used with home and school microcomputers? ______________________________

3. What five steps are involved in the solution of a problem with a computer?

   a. ______________________________
   b. ______________________________
   c. ______________________________
   d. ______________________________
   e. ______________________________

4. What three steps are necessary to analyze a problem?

   a. ______________________________
   b. ______________________________
   c. ______________________________

5. A ____________________ is a way to graphically represent a program design.

6. Make a flowchart to show how you would do one of the activities listed.

   (a) Make a Pizza (b) Water Your Plants

   (c) Change a Light Bulb

7. What does "debugging" mean? ______________________________
____

(The remaining activities are to be completed in the-2 hour class session.)

II. "APPLE LOGO"

Logo is a computer language; that is, a code for translating numbers and symbols that people understand into electronic impulses that the computer "understands". Logo enables you to make the computer do things through the use of commands and procedures. You can teach it how to perform new commands by using things (commands) it already knows. The things you teach it are called procedures. Every new procedure gives Logo more helpers, so that it can do more for you.

Logo isn't just something you learn - it's something you learn with! When you use Logo to make the computer do things, you're learning about the things you're making it do.

A. GETTING STARTED

1. Loading Logo

First, you need to load the Logo language into the computer's memory:

- Make sure the computer is OFF.
- Insert the Logo Language disketted into the disk drive and close the latch/door.
- Turn on the computer by turning on the red toggle System Saver switch (on the left side of the computer) or the switch in the left rear corner of the computer (in which case you will also need to turn on the monitor).
- After about 30 seconds, LOGO will ask you:

```
DO YOU HAVE YOUR OWN FILE DISKETTE?
```

  For now you can ignore this - just press the **RETURN** key.
- After WELCOME TO LOGO appears on the screen, remove the Logo Language diskette from the drive and return it to the storage box.

2. Using Logo

The ? under the "welcome" message is the Logo prompt (remember from Unit I that the BASIC prompt is a]). Logo is telling you it's ready for instructions.

- **Apple //e users: MAKE SURE THE CAPS LOCK KEY IS DEPRESSED

- Now type something simple, like HI. Then press the **RETURN** key. The screen should look like this:

```
WELCOME TO LOGO
? HI
I DON'T KNOW HOW TO HI
?
```

Logo is letting you know that it doesn't understand what you want it to do.

- Type this: PRINT [HI]
  ... and press RETURN

**The [and] keys are not equivalent to (and).
**If you are using an Apple II+, press <SHIFT> N for [and <SHIFT> M for].
(The Apple //e has separate [and] keys.)

Now the screen should show:

```
?PRINT [HI]
HI
?
```

Logo will print anything you put between [and]. Try some other print statements (like ... PRINT [your name] or whatever you like!).

Not only can Logo be used as a <u>word</u> processor, it can also perform arithmetic calculations using the PRINT command.

Type this: PRINT 4+1 (with no brackets)

After pressing RETURN, the screen should show a 5. Note that when brackets are entered (e.g., PRINT [4+1]), Logo PRINTS the statement instead of performing the operation. Multiplication is done by using the asterick (*) character, e.g., 4*5. Division is done by using the diagonal (/) character, e.g., 4/2.

If you make a mistake while you are typing, you can always use the <--- key to erase, then retype, or <CTRL> B (back) and <CTRL> F (forward) to move the cursor over the error, and <CTRL> F to get back to the end of the line.

**Remember from Unit I that you must hold down <CTRL> and press the other key.

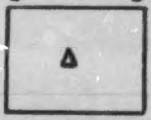
Learn by doing! You <u>can't</u> hurt the computer by typing commands. Type anything you like. On the other hand, Logo is fussy! If it doesn't understand what you type it will complain.

DO NOT PRESS THE RESET KEY WHEN USING LOGO, OR YOU WILL HAVE TO LOAD THE LOGO LANGUAGE DISKETTE AGAIN.

3. Meet the Turtle

Printing and calculating are nice, but many agree that drawing is a more fun way to learn...

- Type CLEARSCREEN (or CS) and press RETURN. This tells Logo to show a blank screen for you to draw on, and to put the "turtle" in the middle of it heading straight up. The screen will look like this:



Here are some new commands for you to use. Note that you can type either the full word or its abbreviation - the result will be the same.

Command	Abbreviation	Result
FORWARD	FD	(moves the turtle forward)
BACK	BK	(moves the turtle backward)
RIGHT	RT	(turns the turtle to the right)
LEFT	LT	(turns the turtle to the left)
SHOWTURTLE	ST	(puts the turtle on the screen)

Before the turtle will move or turn, you have to tell Logo how much to move or turn (called the "input number").

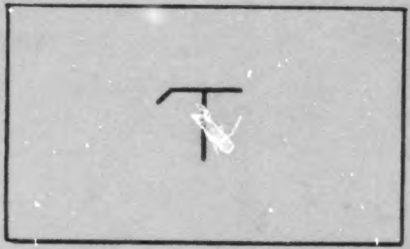
Distances are determined by "turtle steps". One turtle step is hardly noticable. Fifty turtle steps equal 1-1/2 inches.

Turns are calculated by "degrees". As in a circle, a turn of 360 equals a complete rotation, a turn of 90 equals a right angle.

Type these commands. Be sure to leave a space between the command and its input number, and then press RETURN.

```
CLEARSCREEN <RETURN>
FORWARD 50     "
RIGHT 90       "
FORWARD 25     "
BACK 50        "
LEFT 45        "
BACK 25        "
HIDETURTLE     "
```

The screen should look like this:

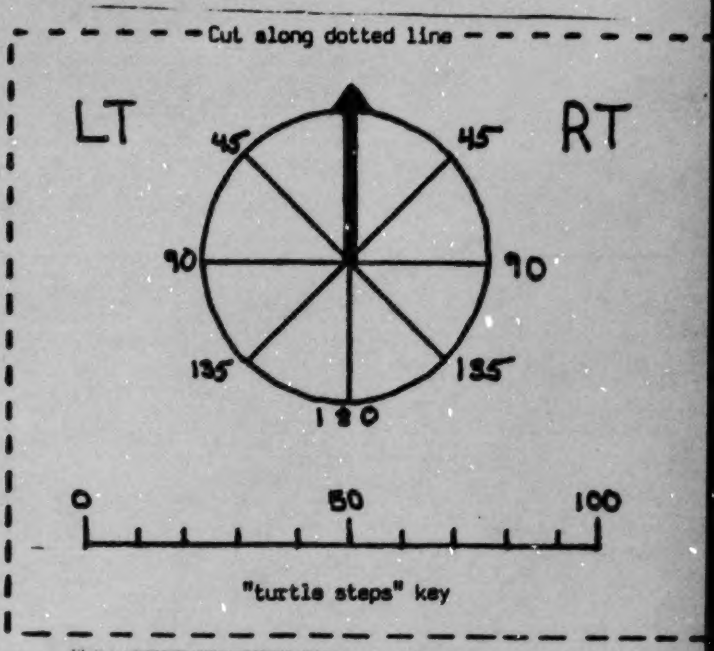


Type CLEARSCREEN (or CS) and SHOWTURTLE (or ST) to get a fresh start. Take about five minutes to have Logo perform other commands; try to predict what the turtle will do.

REMEMBER! -- press RETURN after each command
-- leave a space between FORWARD, RIGHT, etc. and the "input number"

Helpful Hints:

- cut out the circle on the attached page to assist you in estimating degrees and distances.
- "Play Turtle": when unsure which way to turn the turtle, stand up and walk through the turtle commands.
- pretend the turtle is a car moving along on a map; which way should the car turn?

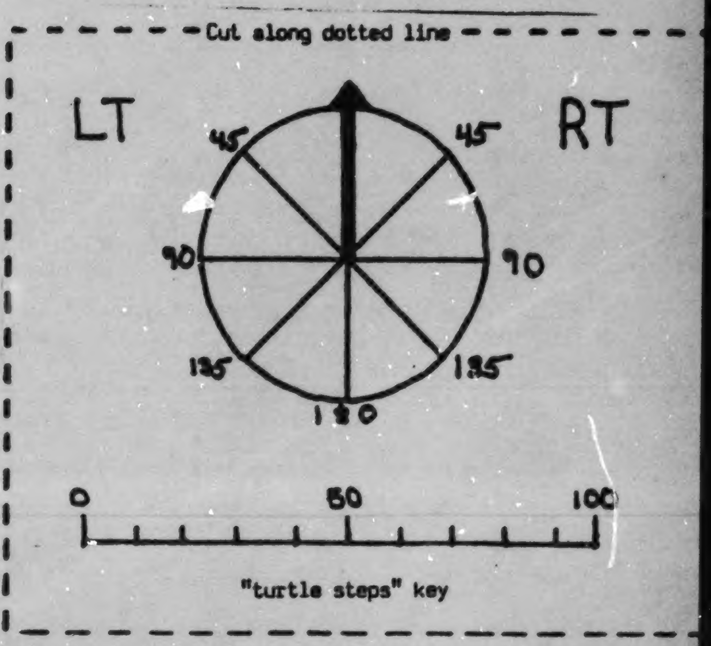

Cut along dotted line
LT
RT
45
45
90
90
135
135
180
0
50
100
"turtle steps" key

Directions for using estimation circle

- point arrow in same direction as turtle

- decide whether to turn the turtle to the LT or RT, based on which way the arrow is facing

- estimate the desired angle by using the 45° intervals on the circle



Cut along dotted line
LT
RT
45
45
90
90
135
135
180
0
50
100
"turtle steps" key

Directions for using estimation circle

- point arrow in same direction as turtle

- decide whether to turn the turtle to the LT or RT, based on which way the arrow is facing

- estimate the desired angle by using the 45° intervals on the circle

EXPLORE A LITTLE (Spend a half hour or so on this section.)

How far is it across the screen? Try a large input number like (RT 1000 or FD 1000). What happens when the turtle goes off the screen? How many turtle steps does it take to move the turtle 3 inches? Can you make a right angle? Try to get the turtle to a particular spot on the screen.

Try making a square: Type:

```
CS
FD 50
RT 90
FD 50
RT 90
FD 50
RT 90
FD 50
```

That's It!

How about a rectangle? Make small and large squares. Try to make a triangle. Can you make a triangle with a horizontal base?

More turtle commands:

PENUP (or PU): Lifts the turtle's pen so it will not draw when it moves.
PENDOWN (or PD): Puts the turtle's pen down so it will draw again.

Experiment with PU and PD before going on.

If a color monitor is available, try the next two commands:

SETPC (set "pen" color from 1 to 5):

0 = Black
1 = White
2 = Green
3 = Violet
4 = Orange
5 = Blue

EXAMPLE:

```
SETPC 4
FD 50
SETPC 3
FD 50
```

SETBG (set background color from 0 to 5)
(same colors as pen)

KEEP AT IT! YOU LEARN BY DOING! Try creating different shapes, using different pen colors and background colors.

B. PROCEDURES

Logo allows you to enter instructions and save them as a PROCEDURE in the computer's memory or save them on diskettes. This eliminates the need to retype the same instructions each time you use the programs. This is programming! Notice the PRINT statement - any text or calculation can be included in a procedure.

```
Type:  TO BOX
       CS            (the turtle will NOT "do" the commands at this
       FD 50          time)
       RT 90
       FD 50
       RT 90
       FD 50
       RT 90
       FD 50
       PRINT [THIS IS A BOX.]
       END           (Don't forget the END command to tell Logo you are
                     finished!)
```

Logo will respond: `BOX DEFINED`

Now type: `BOX`

Logo should draw your box and print the sentence below it!

You can also develop a <u>procedure</u> that will print a written message without any graphics. For example, try this:

```
TO PRAISE
PRINT [HI CLASS]
PRINT [I AM YOUR FRIENDLY COMPUTER]
PRINT [YOU SURE ARE DOING A GREAT JOB]
PRINT [KEEP UP THE GOOD WORK]
END
```

Type: `PRAISE`

(You've got a word processor!)

C. SHORTCUTS

It's tiresome to type in all 4 sides to a square, so try the REPEAT command. You simply tell the computer how many times to do a particular action. For example, to shorten the BOX procedure:

```
TO SQUARE
CS
REPEAT 4 [FD 50 RT 90]
END
```

The computer is instructed to draw FD 50 and RT 90 four times. If the 4 were changed to an 8, another box would be drawn over the first. Try this:

```
TO CIRCLE
CS
REPEAT 360 [FD 1 RT 1]
END
```

Type CIRCLE. How about that!

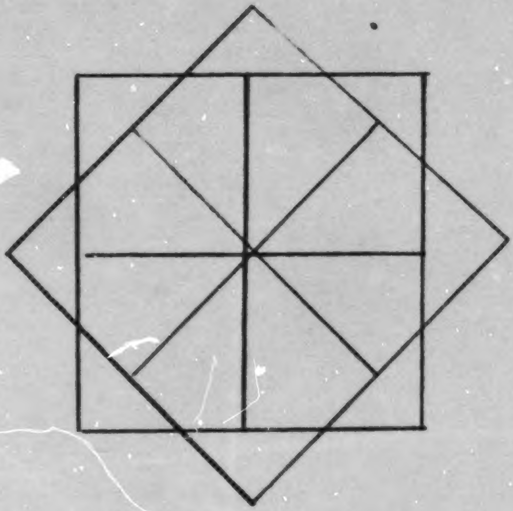
You may list the commands in a procedure by typing: PO "(name of procedure). For example: PO "CIRCLE"

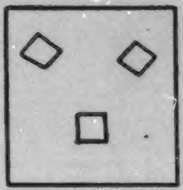
(More on Procedures (such as editing your mistakes!) are beyond the scope of this introduction but are easily obtained from the manual - or a Logo user!)

D. MORE ABOUT LOGO

One of the most intriguing (and most publicized) characteristics of Logo is "discovery learning" -- learning about learning as you learn something! For example, in exploring Logo turtle commands, you may discover that, in order to make a "left turn", you must enter LEFT 90 or LT 90. Using available prior information, you may have first entered LT 50. After noticing that the turtle turned about halfway to the left, you may have tried LT 100 next time.

Once you figured out the left turn, you may have attempted a square and learned that the turtle can draw many shapes and that simple shapes can be used to build more complicated ones like:





Progression from the known to the unknown; building upon previous information to discover new things - you may "discover" more of this in the Logo manual.

Please keep in mind that this unit is only an INTRODUCTION to Logo programming. Though its beginnings are somewhat elementary, it can become as sophisticated as you desire - from squares to circles to "action" programs to college physics. You make Logo what you want.

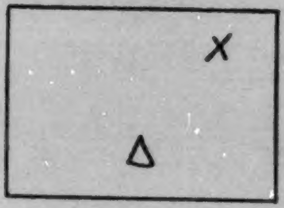
Answer these questions:

1. What is Logo? ________________________________

2. What are some possible classroom applications of Logo?

3. To approximately what degree should you 'input' to make the turtle turn toward the 'x'?

RT ______ ?



4. What is a procedure? ____

____

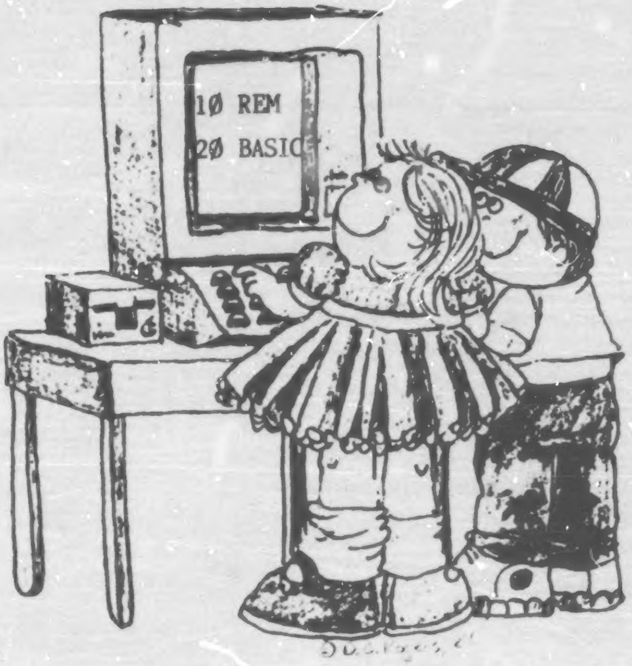
5. Debug the following procedure to draw three parallel lines.

```
TO THREELINES
CS
FD 50
PU
RT 90
FD 10
RT 90
FD 50
PU
LT 50
FD 10
LT 90
PD
FD 50
END
```

UNIT: III

INTRODUCTION TO PROGRAMMING

(BASIC Version)


10 REM
20 BASIC

II. BASIC PROGRAMMING

Now that you are somewhat more comfortable with the keyboard, you will be given some practice with words the computer understands.

STATEMENTS	Commands
REM	NEW
PRINT	RUN
END	LIST
HOME	HOME

First you need to understand a few terms. A line number is typed in first to identify each separate statement in a program. A statement or keyword, is an instruction to the computer that follows a line number. The computer does not follow the instruction until it reaches that line number in your program. A command does not require a line number - it tells the computer to immediately do what you told it to do. Home is in both lists because you will use it without a number to clear your screen immediately and you may use it with a line number as part of a program. We will define the other terms as we use them.

Insert the "System Master" diskette and turn on your computer. Now let's write a few statements on our computer. A statement should include a line number, an instruction, and (usually) information. Be sure to enter all keywords and commands in capital letters.

```
Type:   10    PRINT     4 + 8  (press return)
        20    PRINT    19 - 6  (press return)
        30    END              (press return)
```

* (Be certain that you type 0 (zero) and not the letter O in your line number.)

You have now typed in a program. Type in the command RUN. Your screen should display:

```
10  PRINT   4 + 8
20  PRINT  19 - 6
30  END
 RUN
 12
 13
```

Be sure you press the Return key after each statement. If you make an error before you press Return, simply back up and change the error. If you see an error in a statement you have already entered, retype the whole statement including the line number. You are likely to get a SYNTAX ERROR message on the screen when you enter a statement or command incorrectly. Now type in these statements:

```
 1   REM      THIS IS A PRACTICE PROGRAM
 9   PRINT
15   PRINT
 5   HOME
```

Trust me, the order is not wrong. Now after you've checked to make sure you didn't make a mistake, type RUN. Your screen should look like this:

```
12
13
```

Let's use another command so that you can see what has happened. Type LIST. Your screen should now display the Listing of your program.

```
 1.  REM     THIS IS A PRACTICE PROGRAM
 5.  HOME
 9.  PRINT
10.  PRINT   4 + 8
15.  PRINT
20.  PRINT   19 - 6
30.  END
```

As you can see by comparing what you saw on your screen the first time, the second time, and now, there have been a number of changes. As you look at each line of the program you will see what caused them.

```
1  REM   THIS IS A PRACTICE PROGRAM
```

You will notice that this statement appears in the program listing but not when the program is run.

REM is a short form of REMark - It allows comments to be placed in a program to help you remember the purpose of a section or procedure. The computer ignores these except when you ask it to LIST.

5 HOME - When the computer reaches this line in your program, it follows the command to clear the screen.

9 PRINT - When the computer drops through to line 9, it reads a command to print but there is nothing to print. The computer will leave a blank line and go to the next command. By using PRINT commands in a statement, with nothing following you can create any spacing you wish vertically.

10 PRINT 4 + 8 - When the computer reaches line 10 it follows the command to print the answer to the calculation + 8 4 + 8.

15 PRINT - The computer prints "nothing" and drops down to the next command, leaving another blank line.

20 PRINT 19 - 6 - The result of 19 - 6 is printed.

30 END - When the computer finds this command, it will stop the program even if more lines follow.

You should also notice that the computer listed your program in numerical sequence even though you did not enter it in that order.

The computer always executes a program in numerical sequence. It should be easy to see why line numbers are usually assigned to programming statements in increments of ten. When you are constructing a program, you frequently need to insert statements that were originally overlooked. Spacing the line numbers makes this convenient.

ACTIVITY II:

1. Keywords and commands must always be entered in ________________ letters.

2. What does syntax error mean? ______________________________

3. How do you clear the screen on your computer? ______________
   ____

4. What do these words tell the computer to do?

   a. RUN ____
   b. PRINT ____
   c. LIST ____
   d. END ____
   e. REM ____
   f. HOME ____

5. Why should you usually space line numbers in increments of ten?
   ____

6. If you enter instructions with the line numbers out of order, 10, 30, 40, 20, what does the computer do with the order when it executes the program?
   ____

7. What sequence of events occurs when you tell the computer to RUN this program?

```
10 PRINT 7 + 3   ______________________________
20 PRINT         ______________________________
30 PRINT 8 + 4   ______________________________
40 END           ______________________________
```

8. What happens when you tell the computer to RUN:

```
10 REM I'M PRACTICING   ______________________________
20 HOME                 ______________________________
30 PRINT 2 + 3          ______________________________
40 PRINT                ______________________________
50 PRINT 5 - 4          ______________________________
60 END                  ______________________________
```

If you look back to where the keywords and commands were listed, you will see that we have used them all in the program, with the exception of the NEW command.

The program you have been working on is now stored in the computer's Random Access Memory or RAM. Anytime you command the computer to RUN a selected program it will take the program from its memory, and moving from one line number to the next, execute the program. There are two ways to clear the RAM of an old program. First, programs are lost or cleared if the computer is turned off. If you turn your computer off in the middle of an exercise you are working on, everything you have programmed will be gone when you start up again. Second, an old program will be cleared if you type in NEW.

Type NEW

Now Type LIST

See, there isn't anything to LIST because the old program was cleared when you typed NEW. This command should be used at the beginning of all programs to prevent lines from an older program being used in a new one.

Each time you type in a line number, it clears whatever was on that line number before. Try this. Type in this program:

```
NEW
10 PRINT 2 + 3
20 PRINT 4 + 5
30 END
```

Now type RUN

Your screen should display:

```
NEW
10 PRINT 2 + 3
20 PRINT 4 + 5
30 END
5
9
```

Now type: `10 PRINT 2 + 4`

Type LIST

The program now has 10 PRINT 2 + 4 in place of 10 PRINT 2 + 3. Try typing 10 and press RETURN without typing in anything else. Now type LIST. The computer erased the previous command for line 10 when you typed in 10, and since you gave it no new instructions for line 10, it has been eliminated from your program.

Earlier you were told to pay special attention to quotation marks, commas, semicolons and colons. These punctuation marks are commands in BASIC that give the computer specific instructions. First, let's see what quotation marks do. Type in this program:

```
NEW
10 PRINT "4 + 5"
20 PRINT 4 + 5
30 END
```

Now RUN the program. Your screen will display:

```
NEW
10 PRINT " 4 + 5 "
20 PRINT 4 + 5
RUN
4 + 5
  9
```

Notice what the computer did with line 10. When the computer is given the instruction to PRINT followed by something in quotation marks, it will print <u>exactly what is in the quotes</u>. This is true whether the quotes contain letters, numbers, signs, punctuation marks or spaces. Try it. Replace lines 10 and 20 by typing:

```
10 PRINT "I'M A COMPUTER"
20 PRINT "I CAN ADD 2 + 2"
```

RUN your new program.

The information contained in the quotation marks is called a <u>string</u>.

<u>ACTIVITY III</u>:

1. What does RAM mean? ____________________

2. What happens to your program if you turn off your computer and then turn it on again? ____________________
____

3. What happens to your old program if you type in NEW?
____

4. What would your computer LIST if you typed in 10 PRINT "WHAT IS YOUR NAME?" and then typed in 10 PRINT "MY NAME IS APPLE?"
____
____

5. What would happen if you then typed in 10? ____________________
____

6. Either predict the output for the program or write the program that would cause the given output. Check the example.

	Program	Output
(EX:)	10 PRINT "I'M A COMPUTER" 20 PRINT "I OBEY COMMANDS" 30 END	I'M A COMPUTER I OBEY COMMANDS
A.	10 REM THIS IS PRACTICE 20 PRINT "HELLO" 30 PRINT 40 PRINT "I LIKE TO PRINT." 50 END	____________________ ____________________ ____________________ ____________________ ____________________

B.
```
10 HOME
20 PRINT "MY SCREEN CLEARED"
30 PRINT "BECAUSE YOU TOLD"
40 PRINT "ME"
50 PRINT "2."
60 END
```

C.

I PRINT ANYTHING
YOU PUT IN QUOTES.

EVEN *!#/?@

You can also use your computer to print designs. All you have to do is set up the characters and spaces you want on each line within quotation marks. If you want a complex design, it is easiest to chart it out on graph paper first. For instance, if you want a house, you could do this:

```
 NEW
 10 PRINT "         X       "
 20 PRINT "      X     X T T"
 30 PRINT "   X          X I"
 40 PRINT "X           XX  X"
 50 PRINT "X           XX  X"
 60 PRINT "X               X"
 70 PRINT "X          XX   X"
 80 PRINT "X          XX   X"
 90 PRINT "X          XX   X"
100 END
```

We can also use the PRINT statement to do math. You should remember that at the beginning of this unit we used statements such as 10 PRINT 4 + 3 and the computer printed the answer, 7.

The symbols for mathematical operations are slightly different in BASIC than the ones with which you are familiar.

OPERATION	BASIC	EXAMPLE
Addition	+	4 + 3
Subtraction	-	6 - 3
Multiplication	*	8 * 5
Division	/	8/2
Exponents	^	3 ^ 2

If there is more than one operation in a problem, the computer does the operations in a specific order of precedence, no matter what the order is in the problem.

The order of precedence is:

1. Operations inside parentheses from left to right.
2. Exponents ^
3. * or / which ever comes first, left to right.
4. + or - which ever comes first, left to right.

For instance, if you say PRINT 2 * (4 + 3) ^ 2 the computer will add 4 + 3, then raise 7 to the second power and then multiply 49 times two = 98. 5 + 2 * 4/2 will cause the computer to multiply 2 times 4, divide by 2 then add 5 = 9. The computer will not perform calculations with numbers using dollar signs or commas. 5,436 must be written as 5436. $46.75 must be written as 46.75. The computer will not do math operations with strings, (characters enclosed in quotation marks).

ACTIVITY IV:

1. What would the output for this program be? If you can't figure it out, RUN it.

```
10 PRINT 3 * 5
20 PRINT "$7.55"
30 PRINT 7.55 - 3.51
40 PRINT 14 * 2 - 3 ^ 2
50 END
```

2. In the problems below, write the first operation the computer would perform, and then the final answer.

	First Operation	Answer
(10 - 2)/2	10 - 2	4
1. 3 ^ 2 * 2		
2. 4 + (9 - 5)		
3. 2 * 6 / 3		
4. 5 + 9 - 6 / 2		
5. (8 + 7) * 2 + 3		

3. Write a program that will print your name, your age and your birthdate (you may lie), skipping a line between each.

If you have not yet exceeded 3 hours of work on this unit, or you are dying to learn more about BASIC, then continue with the following activities. Otherwise, you have completed this part of the unit!

Let's look at the comma, semicolon, and colon to see how they are used to change the output in a program.

The <u>comma</u> causes the computer to space out what comes after the comma on one line. The information prints out in what are called zones. Some computers have more zones than others. You will have to experiment with your own model to determine how many zones are available.

```
        Type in:          NEW
                          10 PRINT "ONE, TWO",
                          20 PRINT "THIS IS FOR YOU."
                          30 PRINT "THREE, FOUR",
                          40 PRINT "WE TRY NOT TO BORE."
                          50 END
                          RUN
```

The output will be split into columns.

```
      ONE, TWO                      THIS IS FOR YOU
      THREE, FOUR                   WE TRY NOT TO BORE
```

Notice that the commas within the strings do not affect the output. The comma between the strings is what causes the strings to be printed in zones.

The ; or (<u>semicolon</u>) causes the computer to print the output with no spaces between the strings on one line.

```
                                                      Output
    Try this:        10 PRINT "HELLO";
                     20 PRINT "GOODBYE"            HELLOGOODBYE
                     30 END
```

If you want a space between the words, you must leave one <u>inside</u> the quotes. Change Line 10 to "HELLO " and RUN it again. You will get HELLO GOODBYE.

The : or (<u>colon</u>) allows you to put more than one statement on a line.

```
                                                    Output

        10 PRINT "SPACING": PRINT                   SPACING
        20 PRINT "IS EASY.": PRINT
        30 PRINT "ISN'T IT?"                        IS EASY.
        40 END
                                                    ISN'T IT?
```

If you need to indent a string to make your output look better, you simply space <u>inside</u> the quotes as far as you want before typing the rest of the string.

```
                        10 PRINT "     MY NAME"
                        20 PRINT "DOES NOT MATTER"
                        30 END
```

ACTIVITY V: (optional)

1. What word tells the computer to erase the program in its memory?

   ____

2. What are the words or symbols called that you want printed?

   ____

3. What tells the computer where a string starts and ends?

   ____

4. What statement has to have the greatest line number?

   ____

5. Either predict the output for the program or write the program that would result in the given output.

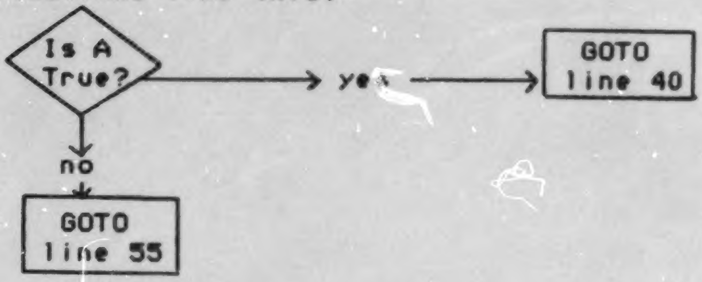
Program	Output

```
NEW
10 PRINT "UP, UP"
20 PRINT "AND",
30 PRINT "AWAY"
40 END

NEW
20 PRINT "A LITTLE BOY"
10 PRINT "MARY HAD"
30 END

NEW
10 PRINT "THIS IS TRICKY:"
20 PRINT "WATCH";
30 PRINT "OUT": END
40 PRINT "DID I FOOL YOU?"
50 END
```

Program	Output

```
I'M OVER             HERE


WHY


CAN'T


I KEEP THINGS        TOGETHER?

JOE                  JULY 1      '43
SUE                  APRIL,  14 '51
SAM                  MAY, 18     '54
```

The computer, as we have seen, does things in order. There is a way to get the computer to skip one or more instructions and go to another line. GOTO ? causes the computer to go to the line number you designate, skipping anything in between. This keyword is very useful in more advanced programs where you are working with variables and want to set up branches in your program called conditional loops. It is used in situations like this:



While we are not going to cover conditional loops, we can create infinite loops. A loop is the continual execution of specific programming statements. Infinite, in this case, means the computer will continue till you stop. Type this:

```
NEW
10 PRINT "I HAVE A TENDENCY TO"
20 PRINT "REPEAT THINGS"
30 PRINT GO TO 20
40 END
```

In this program when the computer reaches line 30, it is sent back to line 20. It can't reach line 40 END at all. You can stop the program while it is running by pressing the C key while pressing the CONTROL key. If all else fails, turn the computer off and restart it.

Let's have some fun. Use your first name in this program and see what happens.

```
NEW
10 PRINT "name", "name", "name"
20 TO TO 10
```

Now practice stopping your runaway machine using CONTROL C and change line 10.

```
10 PRINT "name"; "name"
```

Stop it again.

ACTIVITY VI: (optional)

1. What does a GOTO statement do? ______________________________
   ____

2. What is an infinite loop? ____________________________________
   ____

3. How do you stop an infinite loop? ____________________________
   ____

Write the following programs, test them and then debug them if necessary.

4. Write a program that will result in the following output spaced as it is here.

```
INSERVICE

MEETINGS

ARE                  SOMETIMES

   BORING
```

5. Write a program that will output this statement over and over again with a blank line in between each repetition.

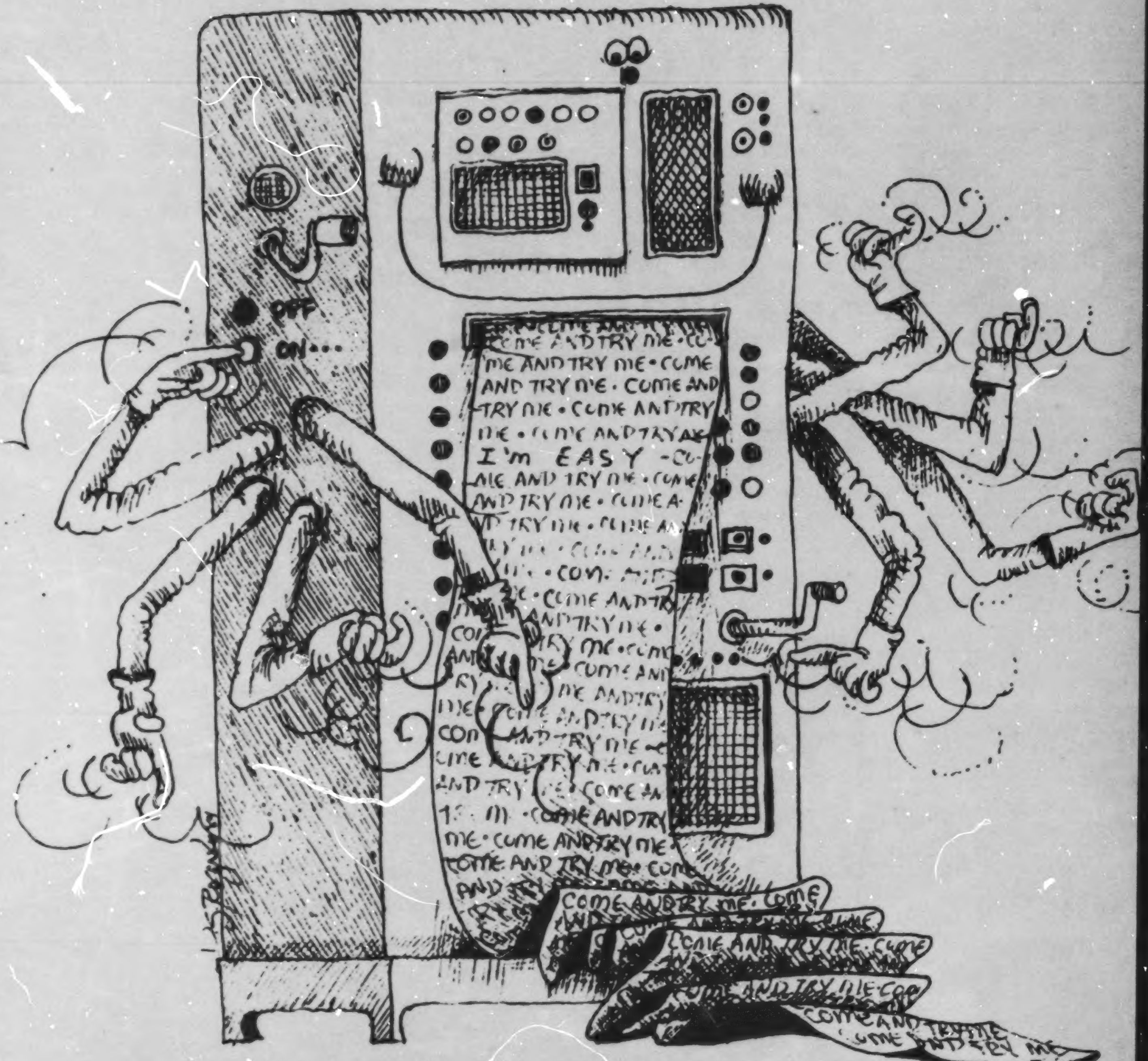
```
I FEEL                  CONFUSED
```

6. Write a program using three print lines that will output I FEEL LIKE THINGS ARE CLOSING IN ON ME! as one word.

UNIT: IV

WORD PROCESSING

BEST COPY AVAILABLE


OFF
ON...
COME AND TRY ME · COME AND TRY ME · COME AND TRY ME · COME AND TRY ME · COME AND TRY ME
I'm EASY
COME AND TRY ME · COME AND TRY ME · COME AND TRY ME · COME AND TRY ME · COME AND TRY ME · COME AND TRY ME · COME AND TRY ME · COME AND TRY ME

UNIT IV: WORD PROCESSING

A SELF-INSTRUCTIONAL LEARNING PACKAGE

FOR

TEACHERS AND STUDENTS

USING PFS:WRITE

BATH COUNTY PUBLIC SCHOOLS

FUNDED BY: VIRGINIA DEPARTMENT OF EDUCATION,
EXEMPLARY LEARNING ENVIRONMENT MINIGRANT PROJECTS

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UNIT IV: WORD PROCESSING

Course Requirements:

The skill level of word processing taught in this unit is not required of teachers in the computer literacy objectives established by the Virginia Department of education. This unit not only introduces word processing, but teaches the participant how to use the basic functions of a word processor.

Why 3 Hours on Word Processing? Because it has been our experience that teachers are more likely to use and enjoy word processing more than any other computer application, both at school and home.

It should take approximately 3 hours to complete the requirements of this unit:

Lessons 1-8, and lesson 12
Lessons 9, 10 and 11 are optional

Although the unit can be completed independently, it is recommended that a group of participants work together, with a person skilled in PFS: WRITE being available for assistance.

*Note that two diskettes are required for this unit: PFS: WRITE and a student diskette.

Bath teachers can obtain these diskettes from a computer coordinator. Others need to purchase PFS: WRITE and may obtain the student diskette by sending a blank diskette and a stamped self-addressed return envelope to the Director of Computer Education, Bath County Public Schools.

(Or you can create your own student diskette by having someone already skilled in using PFS: WRITE to enter the five documents given in the appendix.)

UNIT IV: WORD PROCESSING

Word processing is the most practical use of the computer yet devised. Simply put, word processing is nothing more than using a computer as a typewriter. The keyboard is basically the same. Typing commands are basically the same. The difference is mainly one of memory. The word processor has the ability to store your typed material, either in its own memory or on a diskette, so that you can easily edit out any mistakes or corrections and print a final copy that is error free. No wonder many predict that the standard typewriter of today will soon be, or already is, obsolete.

The applications of this new technology are unlimited. For the teacher, the word processor could be used for typing tests. The tests could be stored on a disk and re-used over and over. Simple changes in individual test items, moving around answers on matching questions, shifting the order of components, such as making the True/False items come first, etc., could all be done quickly and effortlessly. It could also be used to type and store form letters, including progress reports to parents, where only names are changed. For students, word processing would allow term papers and other writing assignments to be edited and printed and stored.

PURPOSE:

The purpose of this in-service unit is to train teachers to use the basic features of the PFS:WRITE* word processing program. PFS is only one of many word processing programs - each having similar and different features. We selected PFS:WRITE because it is almost as easy to learn as the BANK STREET WRITER program which we use in the elementary schools, yet it is much more powerful. Although the completion of the workshop will not be sufficient to qualify you for a job using a word processor, it will give you enough skills to use PFS:WRITE to accomplish about 90% of the everyday tasks for which word processors are used. To learn the remaining skills, you will only need to consult the PFS:WRITE User's Manual, (a very well-written manual), and practice, practice, practice. You will be amazed how easy (and useful) word processing is.

Lessons 1-11 in the unit can also be used by high school students enrolled in a word processing class, or by students in other classes (e.g., English) who desire to learn word processing, but lack close teacher supervision. Some teachers have successfully taught PFS:WRITE to students as early as the fifth grade.

---

*PFS:WRITE is published by Software Publishing Corporation, 1901 Landings Drive, Mountain View, CA 94043. The Software and user's manual are available at most computer stores for about $125.

PREREQUISITE: Familiarity with loading and running simple programs and using the computer keyboard and printer.

OBJECTIVES:

TERMINAL TO ENHANCE THE PRESENT CURRICULUM WITH THE USE OF WORD PROCESSING USING THE COMPUTER

TO INCREASE CONFIDENCE AND ABILITY IN USING THE PFS: WRITE WORD PROCESSING PROGRAM TO PREPARE, PRINT, AND STORE DOCUMENTS

ENABLING After completing this training package each person will be able to:

1. Start the PFS:WRITE Program
2. Use WRITE with one or two disk drives
3. Understand and use all WRITE Keyboard Controls
4. Enter text
5. Edit text
6. Correct mistakes
    a. use the DELETE key
    b. insert characters
    c. remove characters
    d. replace characters
7. CLEAR -- the working copy
8. GET/SAVE/REMOVE documents
    a. list documents
    b. retrieve documents
    c. save the working copy to a WRITE document diskette
    d. remove documents
9. DEFINE PAGE to change the way a document looks
    a. change page length
    b. set top and bottom margins
    c. set left and right margins
    d. add headings and footings
    e. number pages
10. PRINT documents
11. Search and replace a word or phrase
12. Block edit a document
    a. label a block of text
    b. remove a block of text
    c. move a block of text
    d. copy a block of text
13. Print characters in boldface
14. Print characters with underlining
15. Format a line of text

LESSON #1
INTRODUCTION TO PFS:WRITE

OBJECTIVES:

To introduce the basic elements of PFS:WRITE, including the first keys to learn and the Main Menu.

To teach the student what hardware and software are required to use WRITE.

To demonstrate the loading of the WRITE program into the computer's memory.

GETTING STARTED:

To use WRITE, you will need the following equipment:

1. Hardware: -an Apple IIe or IIc computer system
   -at least one disk drive
   -a printer
2. Software: -a PFS:WRITE program (IIe or IIe/IIc version, depending on computer used)
   -a student diskette (i.e., a diskette with lessons for this package stored on it)

*REMEMBER: ALWAYS insert the diskette(s) BEFORE you turn on the computer. Return to MAIN MENU and turn the computer OFF before taking out the diskette(s).

THE FIRST KEYS YOU SHOULD KNOW:

Before you load the program, locate the following keys. Remember that whenever CTRL appears it means that you need to hold down the CTRL (or CONTROL) key while you press the other key specified.

1. CONTROL C - tells the program to process your instructions or Continue with the function selected. (Note that many users first confuse this command with RETURN since RETURN is often used in other programs for the same purpose that CONTROL C is used here.)
2. ESC - returns, or ESCapes to the Main Menu.
3. TAB - moves the cursor forward to the next item on the menu. It also works like a typewriter tab key when typing.
4. <-- - moves the cursor to the left.
5. --> - moves the cursor to the right.

6. ↑ - moves the cursor up one line.

7. ↓ - moves the cursor down one line.

LOADING THE PROGRAM:

To load the program follow these steps:

If you have two disk drives:

Insert the WRITE Program diskette into Drive 1 and the student diskette into Drive 2.

OR

If you have only one disk drive, the procedure is a bit more cumbersome. You will need to insert the program diskette (the one with the PFS label) first, but later remove it and insert the document (student) diskette whenever you GET or SAVE a document. Fortunately, the computer will tell you when and how to do this.

Now turn on the computer and you will see the red light(s) on the disk drive(s) light up and then the PFS:WRITE MAIN MENU will appear on the screen. You are now ready to experiment with word processing.

THE MAIN MENU:

The MAIN MENU that you are looking at presents the five major functions of the word processor and asks you to select one of them.

1. TYPE/EDIT
2. DEFINE PAGE
3. PRINT
4. GET/SAVE/REMOVE
5. CLEAR

You can probably guess what each function allows you to do. Which one do you think you would need to select if you were to:

a. Tell the computer what you want the pages of your document to look like?
b. Enter a new letter, or document?
c. Output, or print, the letter on a sheet of paper by using a printer?
d. Erase the entire screen so you start over?
e. Use the computer like a filing cabinet to get or remove documents that you previously filed and to store new ones?

Answering these questions should give you a basic idea of the process of word processing. Basically, you first type or edit a new document (or one that you previously stored on a diskette), tell the computer how to print it, and then print it. Later you can go back and make changes, providing that you saved it, or you can remove it. Let's now examine the specific purpose of each function.

TYPE/EDIT - The first time you enter any part of a letter, or document, you need to select this option. Using this function, you can type or edit a document. It is critical to remember that the computer first places whatever you type into temporary memory. This is similar to writing on a chalkboard. If the chalkboard is cleaned every evening, you're not going to see what you wrote when you return to class the next morning unless you write SAVE on the board. When you first select the TYPE/EDIT function you are presented with a clear slate. Don't expect to ever see what you write again unless you tell the computer to SAVE it (Option #4).

DEFINE PAGE - This function allows you to determine how your document will appear on the page when printed. You can define paper size and margins, add headings, footings, and/or margins, and tell it to print page numbers. Or, you can forget this function and let the computer use standard settings.

PRINT - If you want a paper copy (or "hard" copy) of your document you need to select this function. It gives you several options: Do you want all pages printed or only selected ones? How many copies? Double or single space or print on an envelope? Other less-used options are also offered.

GET/SAVE/REMOVE - Here's where the computer shows its stuff! This function allows you to treat your computer like a simple filing cabinet. You can retrieve documents from storage, save them for later use, or get rid of them to make room for more documents.

IMPORTANT NOTE: Remember reading earlier that when you select TYPE and enter a document it is placed into temporary memory. We call what is stored in temporary memory of the computer the working copy. If it has not yet been stored on a diskette, don't expect to be able to find it again unless you use the SAVE function. Likewise, whenever you GET a document from memory it remains in permanent memory on the diskette (unless you ask to REMOVE it) and is also placed into temporary memory so you can make changes, without destroying the original document.

CLEAR - This function allows you to erase whatever you have in the working copy (temporary memory). For example, if you are typing a new document (i.e., one that has not yet been saved) or examining an old one retrieved from the diskette's memory, you can clear the screen to work on something else. Of course, you would lose your working copy (but not the old document that previously was stored).

SELECT one of the five options by simply typing the number of the option and then CONTROL C.

HELP!!

If you forget what each function does or forget which key to press to execute a certain command, you can ask the computer for assistance.

For an explanation of the items on the menu: When the Main Menu is on the screen press the Open Apple key at the same time that you press the H key (for Help) and an explanation will be displayed.

For an explanation of your options while using the TYPE/EDIT Function: Press the Open Apple key at the same time that you press the H key (for Help) and the screen will display a listing of the editing functions and cursor movements. CONTROL C will take you back to the TYPE/EDIT mode, or ESC will take you to the MAIN MENU. You will experiment with the HELP function in the next lesson.

Examine each of the five options, but do not enter any text, before beginning Lesson #2. Also, it is recommended that you re-read this lesson before proceeding.

LESSON #2
HELP, TYPE/EDIT, CLEAR

OBJECTIVES:

To provide practice in the use of CONTROL C, ESC, and OPEN APPLE H keys.

To provide practice in the use of TYPE/EDIT and CLEAR functions.

Load the WRITE program.

With the Main Menu displayed on the screen, press the Open Apple and H keys simultaneously. What is now displayed?

____

Return to the Main Menu by pressing ____________________________________.

Select the TYPE/EDIT option by typing 1 and then pressing CONTROL C. You now should be looking at an outlined blank piece of paper.

Type a few sentences - enough to see what happens when the cursor comes to the end of a line. What happens?

____

This is called "word wrap". Unlike using a typewriter, you don't need to worry about hitting the Return key at the end of each line.

Now return to the MAIN MENU, but first pretend that you have forgotten which key to press. Which keys would you press for assistance?

____

If you answered Open Apple H then you have at least 2 bytes of memory in your brain!

Press Open Apple H and read the list of functions. What key do you need to press to return you to the MAIN MENU?

____

Press the key that returns you to the MAIN MENU.

The sentences that you typed have not been lost. The "working copy" of your document is stored in temporary memory.

Return to the working copy by selecting option ______________ (press Open Apple H, if you don't know the answer).

Type a word or two.

Return to the MAIN MENU by pressing the _________________ key. Let's say that you now want to type a new document. You want a clear piece of paper and do not want to ever see the working copy of your present document again. Other than turning the computer off and on (or using Reset) how can you CLEAR the working copy from memory? (If you didn't get the hint, press Open Apple H).

Clear the working copy. Notice the neat warning. The program tells you that you will never see your sentences again if you continue by pressing CONTROL C, and gives you the option of abandoning your desire to clear the working copy.

If you haven't cleared the working copy yet, go ahead and do it. Now return to the MAIN MENU by pressing ESC.

Turn the computer off and carefully remove the diskettes. (Note that you did not need the student diskette for this lesson because you neither retrieved a document nor saved a document.)

LESSON #3
GET/SAVE/REMOVE AND CURSOR MOVEMENTS

OBJECTIVES:

To provide practice in the use of GET/SAVE/REMOVE functions.

To provide practice in the use of cursor movement keys.

Load the WRITE and student diskettes into memory. When the MAIN MENU appears, press Open Apple H. What option do you need to select for you to retrieve or get a document from the student diskette?

____

Return to the MAIN MENU, select the retrieval option, and then press CONTROL C. This will take you to the GET/SAVE/REMOVE MENU. Select GET DOCUMENT by Typing 1. Before proceeding, let's introduce the TAB key and the use of document names.

Pressing the TAB key moves the cursor to the next item on a menu, or to the next tab stop (as with a typewriter).

Press the TAB key a few times. What happens? ______________________

____

DOCUMENT NAME:

When you CLEARED the working copy of your sentences in Lesson #2, you lost them for good. You could have easily saved the sentences by using the SAVE function. Then later you could have retrieved the sentences using the GET function, or removed them using the REMOVE function. To use the GET/SAVE/REMOVE functions you need to give the working copy of your document (or sentences) a name. Thus, in order to continue with this lesson you must GET the document that was stored on the student diskette by George Bear, Bob Gentzel, Barbara Mernin, and Gwen Phillips while they labored over this project during the summer. You should be impressed with what they have composed. But wait before you GET the document named EXERCISE.1. First, a couple of important things to remember about naming a document.

1. Do not try to give two documents the same name. If you attempt to do this, your second document will replace the previous document that has the same name. Fortunately, the program gives you a warning when you try to give two documents the same name.

   Note however that many times you will want to replace the previous document with a new one, particularly when you have edited the first version and want to save the edited version only. This is when you would ignore the warning and replace the earlier document with the new one using the same DOCUMENT name.

2. If you ever forget the name of a document or just want to see what has been saved on the diskette, leave the DOCUMENT NAME item blank and press CONTROL C. The program will give you a list of the document names that have already been entered and will ask you which one you want to use.

3. When you give a document a name:
   a. Use no more than 15 characters.
   b. Use a letter in the first character-the following characters may be letters, numbers, or periods.
   c. Do not use a blank space. For example, enter Exercise.1 and not Exercise 1.

Now, with the cursor located at the DOCUMENT NAME item, type in EXERCISE.1 and press CONTROL C to see the impressive composition.

Then, Return to the MAIN MENU by pressing the ESC (ESCape) key.

What would be the simpliest way to retrieve Exercise.1 if you had forgotten whether it was Excer.1, Excercise.1, Lesson.1, etc.?

First, select ______________________ on the MAIN MENU.
Press CONTROL C.
Then, at the GET/SAVE/REMOVE MENU, you would select option #____
and then CONTROL C. This will give you _______________________
and you would type _________________________ then CONTROL C to
get Exercise.1.

TRY IT: Practice getting more files by first pressing the ______ key to return to the MAIN MENU and then following the steps above.

CURSOR MOVEMENT KEYS:

Return to Exercise.1 to practice using the cursor movement keys that follow.

Use the four arrow keys to locate the cursor at the first letter of the following words in the given order (note what happens whenever you hold the key down):

The
little
Mary
went
everywhere

Now learn a couple of short cuts for moving the cursor: Press CONTROL G (for GO to), then B. Where does the cursor go?

____

Press CONTROL G (for GO to), then E. Where does the cursor go?

____

Move the cursor to the beginning and press RETURN. What happens?

____

Press Open Apple <--- (both keys simultaneously) and watch the cursor move to the previous word.

Press Open Apple --->. This moves the cursor to the ________ word.

Move the cursor to the end of a line, now press Closed Apple <---. Where is the cursor now? ____

Now press Closed Apple ---> to move to the end of the line.

Practice using the above cursor movement keys.

LESSON #4
TYPING AND SAVING YOUR DOCUMENT

OBJECTIVES:

To review the GET and CLEAR functions.

To introduce and use the SAVE function

To introduce and practice keys that remove characters.

Load the PFS:WRITE and student diskettes.

GET the document named EXERCISE.1 (use Open Apple H if you need assistance)

Let's change this beautiful composition. First, move the cursor to the "H" in "His". Type "Her".

Now move the cursor to the end of the document by pressing CONTROL ____, then ____.

Type "go".

There! It looks better. Let's save your working copy of the poem and remove the earlier version.

Here is how to do it:

Press ESC to return to the ______________________________.

Select option 4.

Press CONTROL C.

Selection option 2 (SAVE DOCUMENT).

Type EXERCISE.1

Press CONTROL C.

Notice the WARNING that you will lose the earlier version of EXERCISE.1 if you continue. Because that is what we want to do, press CONTROL C.

Return to the MAIN MENU.

Retrieve EXERCISE.1.

Voila'! The old version is gone and has been replaced with the new one.

Let's pretend that you are a bright and creative person whose writing talents have been invigorated by editing this poem. You want to write your own poem this very minute. What would you do?

First CLEAR the working copy by pressing ____________ and selecting option #____ on the MAIN MENU.

Don't worry about losing EXERCISE.1 because it was saved before you cleared your working copy.

Type this new poem, exactly as it appears below:

Larry has a big harry cat.
It's hair was black as tarr.
And everywhere it eight and ate.
Until it couldn't go very far.

Now SAVE this new masterpiece as follows:

First return to the MAIN MENU.

Select option #_____ .

Press CONTROL _____ .

Select option #_____ on the GET/SAVE/REMOVE Menu.

Name the document: How about Harry's Hairy Cat? Nope! That will not work. Why not?

1. You can not use more than _______ characters.
2. You can not have a _____________ between characters.

So name it Hairy.Cat (If you entered the first name, make the correction by typing over the first name and then pressing the space bar to remove unwanted characters.)

Press CONTROL C.

HAIRY.CAT has now been stored on your student diskette. Check by using the GET function and leaving the DOCUMENT NAME item blank before pressing CONTROL C. HAIRY.CAT should appear on the list of documents.

LESSON #5
REMOVING CHARACTERS AND DOCUMENTS

OBJECTIVES:

To review cursor movement keys.

To introduce and practice using keys that remove characters.

To introduce and use the REMOVE function.

Most likely you are not satisfied with the document HAIRY.CAT. Perhaps you want to delete letters or words in it or REMOVE the entire document. Before loading the computer let's examine the different removal procedures.

To delete a character you can use one of three methods: space bar, CONTROL R, and DELETE. There are times when one may be preferred.

1. With the cursor on the character, press the space bar. This deletes the character but also creates a blank space.

2. With the cursor on the character, press CONTROL R (for remove). Notice that the character(s) to the right move to the left when you use this procedure. No blank spaces are left.

3. With the cursor to the right of the character, press the DELETE key. This is useful when you want to remove previous characters.

To delete a word, place the cursor on any character in the word and press CONTROL W (for Word).

To delete an entire line, place the cursor anywhere on that line and press CONTROL E (for Erase).

Note that you can easily remove multiple characters, words, or lines by holding the above keys down. You can also replace characters by simply typing over them.

A QUICK REVIEW

Load the PFS and student diskettes.

Select the GET/SAVE/REMOVE option on the MAIN MENU.

Press CONTROL C.

Select the GET option #____.

Press TAB.

Type the document name HAIRY.CAT

Press CONTROL C.

Now press Open Apple H and answer the following:

Which key(s) would you use to:

Delete previous character ______________________________

Remove a character ______________________________

Remove a word ______________________________

Erase a line ______________________________

Move to the beginning of the next line ______________________________

Move to the end of the document ______________________________

Move to the end of the line ______________________________

Practice removing characters, words, and lines in HAIRY.CAT as follows:

Move the cursor to the "s" in "has" and remove the "s" by pressing the space bar. Move the cursor one space to the left and type "d" to give you "had".

Move the cursor to the first "r" in "hairry" by pressing Open Apple ---> three times and then the right arrow 2 times. Type "i". You should now have "hairy"

Move the cursor to the beginning of the next line by pressing the ______ key. Then move the cursor to the apostrophe in the word "it's" and press CONTROL R. (If you had used the space bar or DELETE procedure you would be left with a blank space that would need to be removed.)

Use the CONTROL R technique to remove the extra "r" in "tarr".

Move the cursor to the "e" in "eight" and type "ate". Notice that you are left with two unwanted letters. Remove them by pressing CONTROL R twice.

Now go back to the word "big" and erase the word by pressing _____.

Finally, erase that ridiculous sentence at the end of the page by pressing _____ when the cursor is anywhere on that line.

Now that we have corrected the errors in a more creative composition than that in EXERCISE.1, let's SAVE the revised HAIRY.CAT and REMOVE EXERCISE.1 (since it is taking up valuable memory space). To SAVE new HAIRY.CAT (let's call it HAIRY.CAT.2):

Return to the MAIN MENU by pressing _____ and select option number 4.
Press CONTROL C.
Select SAVE, option number 2.
Press TAB.
Type document name HAIRY.CAT.2
Press CONTROL C.

To REMOVE EXERCISE.1:

Select option number 4 (GET/SAVE/REMOVE).
Press CONTROL C.
Select option #3 (REMOVE DOCUMENT).
Press TAB.
Type EXERCISE.1
Read and then ignore the WARNING.
Press CONTROL C.

HAIRY.CAT.2 has now replaced EXERCISE.1 on the student diskette.

LESSON #6
INSERTING

OBJECTIVES:

To introduce and practice inserting characters.

To review previously introduced concepts.

When we edited Hairy.Cat you may have wondered how you could have inserted new words, or new lines, to improve the poem. Inserting characters is one of the most impressive functions of a word processor. For example, after having typed a five page report you may notice that you have left out the second paragraph, or want to drastically alter it. Re-typing the report would take you at least an hour, but using the word processor to insert your changes would take no more than 10 minutes. Or perhaps you want to send an original of the letter, and not zeroxed copies, to 24 parents. Instead of typing 24 originals, you could enter one in the word processor and then only change the names for each letter (there is actually an even quicker way using PFS:FILE and WRITE together, but you will have to see the PFS:WRITE manual for that).

TO INSERT CHARACTERS you use CONTROL Y (for Ynsert; sorry but the PFS developers either couldn't use "I" or didn't know how to spell). You press CONTROL Y either before or after you move the cursor to the place where you want to make the insertion. Insert what you want. If you have no more insertions, press CONTROL Y to leave the INSERTING mode. Let's try it:

First, GET the document named EXERCISE.2. (If you forgot how to retrieve a document go back and re-do Lesson 3).

An error appears in each sentence of this document. In the first sentence you need to insert a space. To do so:

Move the cursor to the letter "a" in "are".

Press CONTROL Y. Notice that "INSERTING" appears at the bottom of the screen whenever you are using this function.

Press the space bar. Notice that all the characters to the right of the space are moved one space.

In line 1, the words "are" and "that" are reversed. To correct this error:

Move the cursor to the "a" in "are".

Type "that are always ". Notice that "are that" remains.

Do you remember how to erase a word? If not, find out by using Open Apple H or by reading Lesson 5. Remove the words "are" and "that".

In line 2, change the first "s" in "reposts" to a "r". Note that you could do this one of two ways. Since the correction involves the same number of characters (i.e., 1), you do not need to be in the INSERTING mode. You could simply type a "r" over the "s". However, since you are already in the INSERTING mode and plan to do more insertions, you may want to move the cursor to "s", type "r", and then remove the "s" by pressing CONTROL R. Try it.

Line 3. You need to insert a space at the beginning of the line to move everything over.

Line 4. We forgot the last word. Insert "reports". You try it without any help.

Line 5. Woops! Line 6 should be Line 5. Move the cursor to 6 and replace it with 5. Change 5 to 6. Remember, you have choices of how to do this - with or without INSERTING. Try both methods.

Return to the true line 5 and insert a space between "about" and "in". Check to make certain you are in the INSERTING mode.

Insert an "a" in eduction. Move the cursor to the letter ____. Type "a".

Line 6. Correct the word "apearance".

There! How does it look? Don't you think it would look better if you moved line 2 down one space? To do it, you would INSERT a space by moving the cursor to the end of line 1 (let's see some fancy cursor movements including Closed Apple --->). Now press RETURN.

Don't forget to SAVE this corrected document. Otherwise, if you turned the computer off now and returned later, you would find only the copy with errors. To save it you can either give it the same name, EXERCISE.2, and thereby replace the previous version (remember you can't have two documents of the same name), or give it a new name. Let's give it a new name, EXERCISE.Y. Advance to the GET/SAVE/REMOVE MENU, select 2, enter the new name, and press CONTROL C.

LESSON #7
DEFINE PAGE

OBJECTIVES:

To introduce and practice the DEFINE PAGE procedure.

To review commands to remove characters.

Load the WRITE and student diskettes into memory. GET the document EXERCISE.3 by choosing option #_____ in the MAIN MENU.

Remove or erase all text above the two paragraphs. This task may be done several ways:

- Position the cursor over the first character and hold down CONTROL R until the four lines are gone. Or,
- Position the cursor over the first character and hold down CONTROL W until the four lines are gone. Or,
- Position the cursor on the first line and Press CONTROL E four times.

Press ESC to return to the _________________. Choose option #2 DEFINE PAGE.

This function allows you to change the way a document looks. Remember that what you see on the screen is exactly what will be printed on paper. Margins on all four sides of your document may be changed to meet whatever need you may have. Also page length can be altered to accomodate shorter or longer sheets. Standard headings and/or footings can be automatically printed on the document. PFS: Write can automatically number pages in a document when a number is entered in the footing.

Sometimes you may want to have the left margin of a document increased to allow for binding. Let's do that now. Make sure the cursor is at the LEFT MARGIN item and type 20. Press CONTROL C to go on. PFS tells you it is changing margins, and then takes you back to the newly revised document.

Notice that the lines of text wrap around to the following line to accomodate the larger margin. Now you alter the right margin to some number between, say, 50 and 75:

1. Press ESC to return to the _________________________.
2. Choose option #____ to DEFINE the page.
3. Move the cursor by pressing ___________________ twice.

4. Change the RIGHT MARGIN #.

5. Press CONTROL ____ to go on.

Other margins (top & bottom) are changed the same way. Change the top margin now. Press Open Apple for help if you need to. What happened?

____

____

In a multiple page document, you may want a heading or footing added to each page of a document. For example, you may want the title to appear at the top of each page. Another possibility would be to have your name printed as a heading. Go to the MAIN MENU and choose option #2. Move the cursor to the HEADING item and type your name. Press CONTROL C to go on. Your name should appear at the top of the document. The same process is done to enter a FOOTING in a document.

PFS will automatically number the pages in a document by entering the starting page number (not necessarily a 1) in the footing. Keep in mind:

- if there is a number in the footing, PFS assumes it is a page number, and increases it by one for each successive page.

- if there is more than one number in the footing, PFS assumes the last number is the page number.

LESSON #8
PRINTING

OBJECTIVES:

To introduce and practice the Print function.

To review previously introduced concepts.

** You must have a computer equipped with a printer to complete this lesson.

Perhaps you have been telling your friends about this great poem "hairy.cat" but just can't remember how it goes. Wouldn't it be great to have a printed copy?

Load the PFS and student diskettes into memory.
GET the document HAIRY.CAT.
Press ESC to go to the MAIN MENU.
Choose option #3 to PRINT.

The PRINT OPTIONS menu appears on the screen. Look at the "default" options indicated, but don't change any yet. Press CONTROL C to continue.

Make sure the printer is ON, the paper is properly aligned, and that the ON LINE indicator light is illuminated.

Press CONTROL C to print your masterpiece!

When you return to the MAIN MENU, press option #____ again to PRINT. Let's look more closely at the print options:

- FROM PAGE ____ and TO PAGE ____

  These 'page numbers' do not relate to page numbers assigned in the footing. They are absolute page numbers; the first page printed (no matter what its # is) is Page 1, the second page printed is Page 2, etc.. These page numbers correspond to the numbers shown in the status line of the working copy. You may choose to print a single page or a range of pages. To print a single page of a multiple page document, enter that page number in both the FROM and TO items.

- PAUSE BETWEEN PAGES

  PFS allows you to stop printing between pages, to give you time to insert a new piece of paper if you are using a letter quality printer.

- NUMBER OF COPIES

  Want to give a copy of the poem to a friend? Type 2 for this item!

- SINGLE/DOUBLE/ENVELOPE (S/D/E)

  This item concerns the type of line spacing you want in the document. The default is single spacing. To double space, type D, PFS allows you to print addresses from letters. For more information on this option, consult page 3-6 in the PFS Manual.

- INDENT

  You can choose to have your whole text indented from the left margin.

The last two options are beyond the scope of this program. Chapter 6 in the PFS Manual explains how to include graphs and tables within a printed document.

Try manipulating the different print options to get different results. Go back to the MAIN MENU and GET EXERCISE.#3. PRINT it.

LESSON #9
SEARCH AND REPLACE

OBJECTIVES:

To introduce and use the **SEARCH** and **REPLACE** functions.

To practice inserting characters.

Another more powerful, although less used, method of inserting words is the **SEARCH** and **REPLACE** function. This function allows you to search for a specific word or phrase and replace it with another. You can also use the **SEARCH** function alone to locate a word or phrase in your document.

To use the **SEARCH** function all you need to do is press **CONTROL S** (for Search) while the document is on the screen. Then press **CONTROL C** and three items will appear at the bottom of the screen:

SEARCH FOR:
REPLACE WITH: **MANUAL OR AUTOMATIC (M/A):**

Using the TAB key to move from item to item, you may fill in one or more items. For example, if you want to substitute "John" in a Dear John letter with "Susan" you first type in Susan, then John. If you want the computer to automatically replace "John" with "Susan" each time "John" is located in the document, then type "A" (Automatic) at the last item. On the other hand, if you want to replace "John" with "Susan" at only certain spots and leave the word "John" at others, then you would type "M" (Manual) at the last item and the cursor will stop each time "John" appears. The program will ask you if you want to replace it with "Susan". Type Y (Yes) if you do, N (No) if you do not, or Q (Quit) if you want to quit the search. Of course, if you only want to replace "Susan" with "John" at certain spots (and call her another name at other spots) then you would only enter "John" at the first item, allowing you to search throughout the document and insert other names as you like.

Before we try this function, you should know that you can search for partial words or phrases if you want to. This is handy whenever you want to search for words that you forgot how you spelled (Mrs. Dofflemeyer or Mrs. Dofflemyer?) or for several words with the same parts (e.g., computing, computers, computer). To search for partial words of phrases, you use .. (two periods) to indicate unknown characters. For example:

If you type:	WRITE will find:
Com..	words beginning with com (computing, computer, communist, etc.)
Comput..	computer, etc., but not communist
..yer	words ending with yer
..fflem..	words with fflem anywhere in the word

LOAD WRITE and the student diskette into the computer.

GET the document named Minutes.

Here is a good use of SEARCH/REPLACE. Instead of typing new minutes monthly, why not just update the previous mintues?

Press CONTROL S (for Search)
Type library
Press TAB
Type auditorium
Press TAB
Type M
Press CONTROL C
Type N (for No)
Type Y (for Yes)
Type Q (for Quit)
Type CONTROL G, then B
Press CONTROL S
Delete library
Type Oct.. (since you are not sure if you abreviated the word)
Press TAB
Type November
Press TAB
Type A (for Automatic)
Press CONTROL C
Return to Main Menu

Now, you do it without looking at the directions above and insert some additional words for practice.

First, CLEAR the working copy (remember that the original SEARCH document remains stored on the diskette, but without your revisions), then GET MINUTES again.

Now, Search for "library" and replace it with "auditorium" in the first sentence. Search for "Oct.." and replace with "November".

Insert the following at the end of the fourth sentence;

entitled "Fun With Learning"

Return to the Main Menu and SAVE your new document naming it MINUTES.N.

LESSON #10
BLOCK EDITING

OBJECTIVES:

To introduce and use BLOCK EDITING procedures.

To review previously introduced concepts.

Inserting and deleting WORDS are powerful uses of the word processor. But how about editing lines and paragraphs? Whenever you need to insert or remove more than one word it is often easier to use a procedure called BLOCK EDITING.

The first step in block editing is to LABEL what you want to remove or insert. You can "label" as many characters, words or lines (up to 10 lines) as you wish for a block editing procedure. Just move the cursor to the first character you want to label and press CONTROL L (Label). Then move the cursor to the last character you want to label. The "labeled" text appears highlighted on the screen.

Let's try some Labeling: and learn how to Remove the Block:

Load the PFS and student diskettes.

Select option #4

GET the document EXERCISE.3

Move the cursor to the word "Revision" on line 5.

Press Control L

Move the cursor to the space before the beginning of the next sentence. (Note that you may use any of the cursor movement keys to label text. Holding down the Open Apple and the ---> keys simultaneously should be the quickest way to get there.) The sentence is labeled! Press CONTROL R (Remove) to see the magic. You have removed the sentence -- the BLOCK of text. You can get the sentence back by pressing CONTROL D (Duplicate).

Press CONTROL D.

MOVING A BLOCK:

You just learned how to remove a block and make it reappear. After labeling the block by pressing CONTROL L, you then pressed CONTROL ____ to remove it. To make the block reappear you then pressed _________. Now, let's learn to move a block of text from one place to another.

To do so, the block or text still has to be "labeled" and removed. Then you move the cursor to where you want to insert the block of text and move the cursor to the beginning of the first word in the first paragraph.
Label the sentence by pressing CONTROL L and moving the cursor to the end of the sentence.
Press CONTROL R.
Move the cursor to the end of the document.
Press CONTROL D.

COPYING A BLOCK:

Let's say you want to put that sentence also at the end of the first paragraph. Because the sentence has already been labeled, just move the cursor to the end of the paragraph and press CONTROL D.

Type your name at the bottom of the document. "Label" your name and then press CONTROL D. Hold down CONTROL D for a few seconds. Your name can be duplicated over and over again until you run out of memory on the diskette!

Practice block editing procedures with other parts of the paragraph. Can you clean up the document to its original state? If not, you can see the old version by going back to MAIN MENU and GETTING the document again.

Press ESC to go to the ______________________ and turn off the computer.

Return diskettes to their proper location.

LESSON #11
TEXT FORMATTING & PRINT ENHANCEMENTS

OBJECTIVES:

To introduce and use text formatting.

To introduce and use print enhancements.

To review previously introduced concepts.

TEXT FORMATTING:

One of the awkward tasks of typing is centering a line or title on a page. PFS Write has made it simple by using CONTROL F.

Load the PFS and student diskette into memory. GET the document EXERCISE.4.

Let's center the first line (title line). Locate the cursor at any point on the first line.
Press CONTROL F.
A high-lighted area appears at the bottom of the screen. Press C for Center. The line is automatically centered! Now center the second line.

As you may have guessed, you can format the line to the left or right margin also. Try it for the third and fourth lines.

PRINT ENHANCEMENTS:

Print enhancements are ways of "dressing up" your text to emphasize a particular word, line or paragraph. Two of the available enhancements are boldface type and underlining.

The last sentence of the document is the "bottom line" of the article, so let's print it in BOLDFACE so everyone will notice.
Move the cursor to the first character of the sentence. Press CONTROL B to signal boldface type.
Hold down CONTROL B until the whole sentence is highlighted. To see that the text is indeed in boldface type, move the cursor to any character that is highlighted. The word "Boldface" should appear at the bottom of the screen.

The process of underlining is similar to boldfacing. To underline a character, move the cursor to that character and press CONTROL __ (the CONTROL key, the SHIFT key, and the underline key).

Find the letters "CAI" in the document and underline them each time that they occur. Read the document first.

Now find the test title "Test of Written Language". Underline and boldface the title at the same time by pressing
______________________________ and ___________________________.

Now let's print what this whole project was about. Press
___________________ to return to MAIN MENU and choose option #____ to Print. When the PRINT OPTIONS menu appears, just press Control C. Make sure the printer is on and the paper is ready, and press
_____________________ to begin printing.

Turn the computer off when finished, and return the diskettes to their proper location.

LESSON 12: (Teacher Only) CLASSROOM APPLICATIONS

Now that you know how to use a word processor, you need to explore its applications to the classroom, as well as the advantages and disadvantages of using word processing.

What are the potential uses and problems of word processing for you and your students?

POTENTIAL USES:

For Teachers:
- to store tests; easily modified, letter-perfect copies
- to send form letters (e.g. progress reports, class announcements, newsletters)
- to assist with any writing that you may want to later revise (e.g. curriculum guides)

For Students:
- writing assignments, term papers, etc.
- individual or small group editing
- pen pal letters to other students
- storywriting
- classroom newsletter
- class reports

List several potential uses of word processing for YOU and YOUR STUDENTS? Be specific.

POTENTIAL PROBLEMS AND SOLUTIONS

Students' poor typing skills.

- enlist volunteer typists (e.g. older students, typing/business class, parents, you)
- teach keyboarding and typing skills: have students practice keyboarding skills with sheet of paper that has a model of a keyboard on it, offer practice with typing tutorials (e.g., Master Type)

Not enough computers.

- do more group activities (either 2-4 students or with the whole class)
- rotate groups using the computer (one group reviews their draft while the other keys in changes)

Confusion over word processing commands.

- use laminated cue cards of editing commands
- practice using editing commands as a group before revising writing; cover specific editing skills with each session

Poorly written papers appear better when printed on a word processor.

- require revision several times before accepting writing as final copy
- encourage students to re-think old ideas and to add new ideas; give suggestions
- "correction" does not equal "revision" encourage correction of grammatical errors after revision of content and ideas
- add to the student's audience: have other students list reactions and make suggestions for improvement, parents, brothers/sisters
- revise some of your own writing as a group process to take away some threat to students

What are some additional problems you may encounter using word processing in the classroom?

What are potential solutions to these problems?

Identify specific objectives in the school curriculum that may be taught using the word processor.

Appendix: Student Diskette

Document Name: Exercise.1

Exercise.1 --THE GREAT COMPOSITION

Mary had a little lamb
His fleece was white as snow
And everywhere that Mary went
The lamb was sure to

AREN'T WE CREATIVE?

Document Name: Exercise.2

EXERCISE.2

Whatare some uses of word processing?

1. To develop classroom tests, especially exams are that changed annually.
2. To send reposts to parents.

3. To teach students about word processing.

4. For students to write papers and.

6. To know what everybody is now talking aboutin eduction.

5. To improve editing and the apearance of student papers.

Document Name: Exercise.3

Exercise.3

--Excerpt from "Word Processing--Will it make all kids love to write?"
Glenn Fisher
Instructor, February 1983

Every writer and teacher of writing knows that revision is the most important step in writing. Revision is not just rewriting or copying over a paper neatly & fixing up misspelled words and misplaced commas. It means, literally, to see again. Revision is a process of discovery, a way of finding exactly what it is you want to say. Only through revising our writing can we refine and sharpen our ideas and logic. Too often, students get the message that revising a paper is punishment, the price you pay for not "getting it right" the first time. Any tool that encourages students to properly revise & edit their written work is a welcome addition to the classroom. The word processor is that tool.

While little research about the effects of word processing on students' writing has been done, teachers report some interesting preliminary findings. They find that students using word processors write longer papers and revise and edit their work more often and more carefully. And teachers feel it is much more reasonable for them to demand complete revisions of a student's paper when it can be easily revised on a word processor. The overall result is that teachers think their students' writing is better when it is done on a word processor.

Document Name: Minutes

Minutes

Minutes of the October Meeting

The Language Arts Club held its monthly meeting for the month of October on Tuesday, June 21 in the library. The number of members present was 12. The number of members absent was 2. The group moved to the library to view a film. After viewing the film, the group returned to the library for refreshments.

Document Name: Exercise.4

Exercise.4
Bath County's Word Processing Project

In February 1984 Bath County Public Schools received a $7,600 grant from the Virginia State Department of Education to examine the the usefulness of CAI (Computer-Assisted-Instructions) and word processing with remedial English students and to develop this instructional package for teachers and high school students on the use of PFS:WRITE.

Although the amount of computer time per student was limited due to the short interval of the study (March-May), school interruptions, and the behavior problems of the students (including frequent absenteeism), the study was successful in several areas. Students using CAI spelling program out-performed a control group, although they did no better than a comparison group that received non-CAI teacher instruction. Students using the word processor showed little improvement on weekly essays but significant improvement on the Test of Written Language administered before and after the program.

Most encouraging were the evaluative comments made by the remedial English teacher:

"It was obvious that the essays finished on the word processor were far neater than original handwritten copies. These students had trouble writing on line, using even margins, keeping erasures neat, etc. The word processor eliminated these mechanical problems and created a better finished product.

Spelling mistakes were also improved dramatically. Some students were able to correct up to 8 mistakes quickly and effortlessly on the word processor, whereas correcting the same mistakes on their handwritten papers, where correcting a mistake meant recopying the entire paper, was a chore that most of the students avoided at all costs, even if not recopying their papers meant taking a zero. These students would rather take a failing grade than recopy their essays. The word processor eliminated this problem.

The third area that showed the most progress was in improving simple sentence structure. Most of the students could easily go back into their essays and add periods where they had been left out, or add capital letters where new sentences should begin. Again, the reason for their ability and desire to do this on the word processor when I could not get them to do the same thing on their handwritten copies, was that the word processor did not require them to completely rewrite their handwritten versions over every time they made a correction or revision. Consequently, they were more apt to make improvements on the word processor than they were on their handwritten essays.

The word processor can and did create beautiful finished copies that were free of the physical writing problems associated with the students in this class. The problems which the word processor helped eliminate were widely uneven margins, sentences and words off line, words and sentences marred by nervous shakes, smudges, and sloppy erasures."

Both teachers and students found the program to be effective and strongly recommended the continuation and expansion of the project.

UNIT: V

COMPUTERS IN SOCIETY

The computer didn't do it!
D K

BEST COPY AVAILABLE

UNIT V: COMPUTERS IN SOCIETY

Relax! By now you have completed over 85% of the course requirements. This final unit deals with three remaining objectives:

Unit Objectives:

1. The educator will describe the impact of computers on society.
2. The educator will identify ethical, social, and economic issues relating to the use of computers.
3. The educator will recognize the value of computer skills for future education and employment.

(This unit is not intended: to lead you to believe that the primary impact of computers in education will be the replacement of teachers, to demonstrate that you can use computers in unethical ways to supplement your income, or to encourage you to enter a more computer-oriented, and lucrative, career!)

Unit Requirements:

To complete this unit you will need to:

1. View (preferably in a group) the 30-minute videotape "Computer Skills for Education and Employment" which is the second program in the series "On and About Instructions ... Microcomputers" produced by the Virginia State Department of Education.

One copy of the videotape is located in the library of each school.

After viewing the videotape, read the excerpts from MEGATRENDS, THE MICROMILLENIUM, and THE THIRD WAVE and answer the given questions related to the tape and excerpts. (about 30 minutes)

2. Read the article "Ethical, Social, and Economic Issues". Parts of this article were taken from program #16 of "On and About Instructions ... Microcomputers" (in which several Bath educators played a role!), or view the tape. Afterwards, answer the questions based on the article. (about 45 minutes)

3. Read and reflect upon the future predictions and the article "Computer Butlers-At Your Service".

It is recommended that this 2-hour unit be completed in a group situation in which discussion would occur.

UNIT V: COMPUTERS IN SOCIETY

ACTIVITY I:

Based on your viewing of the videotape "Computer Skills for Education and Employment" and reading segments taken from MEGATRENDS, THE MICROMILLENIUM, and THE THIRD WAVE (on the attached pages), answer the following questions:

1. What impact will computer technology have on future employment? Reference your answer to the videotape.

2. In what way(s) does Naisbett differ in his opinion regarding the impact of computers on employment and the opinion(s) presented in the videotape?

3. Will computers have any significant impact on teaching? Explain your answer.

4. Speaking at NASA's Langley Research Center in Virginia in October 1983, Isaac Asimov stated, "If every computer on earth were to suddenly disappear, no industry of any size could continue to exist." Do you agree with this statement? Why? What are its implications relating to careers?

5. Name three careers in which computers are not presently being used (note that practitioners of the oldest profession have been known to use computers to keep records).

WHAT IMPACT WILL COMPUTERS HAVE ON SOCIETY?

John Naisbett in MEGATRENDS, a highly recommended book, writes (pp. 23-31)

With the coming of the information society, we have for the first time an economy based on a key resource that is not only renewable but self-generating.

Now, more than 100 years after the creation of the first data communication devices, we stand at the threshold of a mammoth communication revolution. The combined technologies of the telephone, computer, and television have merged into an integrated information and communication system that transmits data and permits instantaneous interactions between persons and computers. As our transportation network carried the products of industrialization in the past, so too will this emerging communications network carry the new products of the information society. This new integrated communication system will fuel the information society the way energy - electricity, oil, nuclear - kept the industrial society humming and the way natural power - wind, water, and brute force - sustained agricultural society.

We have for the first time an economy based on a key resource that is not only renewable, but self-generating. Running out of it is not a problem, but drowning in it is. For example:

- Between 6,000 and 7,000 scientific articles are written each day.
- Scientific and technical information now increases 13 percent per year, which means it doubles every 5.5 years.
- But the rate will soon jump to perhaps 40 percent per year because of new, more powerful information systems and an increasing population of scientists. That means that data will double every twenty months.
- By 1985 the volume of information will be somewhere between four and seven times what it was only a few years earlier.

We are drowning in information but starved for knowledge.

This level of information is clearly impossible to handle by present means. Uncontrolled and unorganized information is no longer a resource in an information society. Instead, it becomes the enemy of the information worker. Scientists who are overwhelmed with technical data complain of information pollution and charge that it takes less time to do an experiment than to find out whether or not it has already been done.

Information technology brings order to the chaos of information pollution and therefore gives value to data that would otherwise be useless. If users - through information utilities - can locate the information they need, they will pay for it. The emphasis of the whole information society shifts, then, from supply to selection.

This principle is the driving force behind the new electronic publishers who provide on-line data bases, communication channels for sorting through and selecting. These new businesses are selling a medium, not information as such.

The on-line information selection business has already become a $1.5-billion-a-year enterprise; approximately 80 percent of the business gives users direct access to sources (source data bases), while the other 20 percent (bibliographic data bases) tells the user where to find what is sought. Just listing some of the resources is instructive. For example, available through Lockheed's Dialog system are over 100 separate data bases allowing the user access to such diverse informational sources as the National Agricultural Library. The Foundation Grants Index, The Maritime Research Information Service (MRIS), the Social Science Citation Index (SSCI), and World Aluminum Abstracts (WAA).

Despite all of the excitement generated, very few Americans have computers, but their numbers are increasing at a staggering rate:

- From the beginning of time through 1980 there were only 1 million computers, estimates the president of Commodore International Ltd., a major manufacturer of personal computers. Commodore alone expects to match that figure in 1982.
- Dataquest, Inc., a Cupertino, California, market research firm, estimates that over half a million personal computers were sold in 1980, and that the total will grow at least 40 percent annually.
- Apple Computers, a pioneer in the field of personal computers, has sold more than a quarter of a million computers since its beginning in 1977, and currently is selling around 20,000 every month.
- In 1977, only 50 stores catered to computer hobbyists; by 1982 there were 10,000.

THE THREE STAGES OF TECHNOLOGY

Technological processes will first be applied to the old industrial tasks (the second stage of technological innovation).

There are three stages of technological development: First, the new technology or innovation follows the line of least resistance; second, the technology is used to improve previous technologies (this stage can last a long time); and third, new directions or uses are discovered that grow out of the technology itself.

During the first stage of technological innovation, technology takes the path of least resistance, that is, it is applied in ways that do not threaten people - reducing the chance that the technology will be abruptly rejected.

The way society handled the introduction of microprocessors is a classic example of this first stage. The first application of the microprocessor was in toys. Who could object? Robots were first used in jobs considered unsafe or too dirty for humans. Who could object? Robots (for dangerous tasks) and toys represented the unthreatening path of least resistance.

At the same time, this path has created a whole generation of computer-comfortable kids. In five years, young people entering the labor force will have had some form of information device in their hands most of their lives - from calculators to computer games to push-button telephones.

Today we have moved into the second stage of development: The microprocessor is being used to improve what we already have - cars, manufacturing, sewing machines. Today's word processor is nothing more than an improved typewriter, for example, and there are many other examples where computers are also improving what exists:

- The federal government used computers to match job seekers and private job openings under an experimental Labor Department program that may "soon be in coast to coast operation," reported the Portland Oregonian. Congress voted $30 million as the first step in a five-year plan to install the system in every state employment service office.
- An IBM computer is managing energy use in a 481-unit apartment house in Crystal City, Virginia. The $110,000 system cut annual electricity costs by $50,000, according to the building manager.
- Real estate offices in California provide potential buyers with instantaneous information about available housing, financial terms, ownership history. Videotapes show the property.

The list could go on and on. It may be some time, though, before we get to the third stage, where we will create things suggested by the microprocessor itself, inventions and applications that are unimagined now.

To a certain extent, society has readily accepted the technology only because we have been through the first stage of technological development. Only now is technology being introduced into old industrial tasks - the running of factories with information rather than workers - and that introduction is sending shock waves into a labor movement already weakened by the shift away from manufacturing itself.

Unions have been forced to fight automation in both industry and agriculture, sometimes accepting automation in exchange for job security.

One by one, local typographical unions are agreeing to allow newspaper management to automate as long as current union members are given job security. At the Minneapolis Star and Tribune, the union ratified a ten-year contract that requires the company to employ 130 printers, with nearly 400 printers subject to layoffs and reductions in the total workforce.

In California, where mechanization is fast replacing farm workers, the United Farm Workers have criticized the state-supported University of California for doing research and development of labor-replacing farm machinery.

The potential of microprocessors is awesome. The automation of factories and offices, once a futuristic pipe dream, is becoming a reality.

It is no wonder, then, that computers have inspired fear and mystery in workers ever since their powers were first uncovered.

Computer technology is to the information age what mechanization was to the industrial revolution: It is a threat because it incorporates functions previously performed by workers.

The most vivid example in recent technological history, of course, is the movement of robots from the first to the second stage of technological innovation. Robots have expanded beyond the dangerous jobs into the unskilled and skilled labor market. At Ford Motor Company, robots test engines. General Motors uses robotic welders. And there are ten government agencies where robots pick up and deliver mail.

"Robots are coming: the question is how soon. They are going to mean erosion in employment opportunities throughout the industry," said retired UAW's international vice president, Irving Bluestone.

Unlike the Luddites, the antimechanization workers group that destroyed some 1,000 English mills during the early nineteenth century, contemporary workers are so far limited to staging non-violent battles to fight off the advancing computer revolution. In Australia, microprocessors are called "job killers," and in England, a television program entitled "The Chips Are Down" portrayed widespread job loss and economic upheaval because of microelectronics.

Until now, however, the worst fears about automation-related job loss have not materialized. During the 1960s and 1970s, people lost jobs because of temporary recessions and because mature industries in developed countries became less competitive than new industries in Japan or in the more advanced developing countries.

But now labor planners are gritting their teeth again and dusting off the gloom-and-doom scenarios, largely because of the advent of the microprocessor:

- A French government report predicted the country would lose 30 percent of its banking and insurance workers within the next ten years.
- Britain's national trade unions have demanded that no new technology be introduced unilaterally by management.
- In negotiations with Ford in the United States, the United Auto Workers (UAW) demanded the right to strike over technological issues. (They didn't get it.)

Why is the microprocessor causing such widespread concern? The reason is simple: its widespread applicability. Earlier computer technology could be applied to some products, electronics, and large-scale office information equipment, for example, but not others. Microprocessors can improve almost anything, anywhere, and are consequently far more threatening.

In fact, there is virtually no limit to the sectors of the world economy where microprocessors can be put to work. Writes Colin Norman, author of a World Watch Institute paper on microelectronics, "No technology in history has had such a broad range of applications in the workplace."

The British pulication New Scientist offers more precise estimates "The application market for microprocessing technology is about 38 percent of the world's present economy."

Newsweek magazine estimates that "from 50 to 75 percent of all U.S. factory workers could be displaced by smart robots before the end of the century."

Notice that all of the above illustrations are rooted in the second stage of industrial development, the application of technological innovation to the old industrial tasks. It is clear that we are still in the second stage of technological innovation and that the introduction of technology into the industrial workplace is on a collision course with much of the workforce, organized or not.

Labor unions are quick to describe the negative dehumanized work environment after technological innovation. Such is the theme of an article appearing in IN THESE TIMES, a prolabor Socialist newspaper published by the Institute for Policy Studies.

The article describes the operations of a local telephone company where, after new technology is introduced, jobs are reorganized to eliminate responsibility, initiative, and human contact - in short, nearly everything that makes work rewarding. Workers found their jobs dehumanizing and robotlike, the stereotype of what we have come to fear: Workers get their daily assignments from a terminal and spend most of their day doing routine monitoring work. Because these machines have no moving parts, they rarely break down. If something important goes wrong, management takes over to do the more interesting troubleshooting work. The article's sentiment is clear: This is where labor thinks we are heading.

One would be tempted to dismiss this discouraging forecast as just so much Socialist rhetoric. The problem is that the same scenario keeps reappearing in the research of technology experts with no particular ax to grind.

One such expert is Robert Lund, the assistant director and senior research associate at MIT's Center for Policy Alternatives. Lund recently conducted a study for the British Department of Industry on the impact of microprocessors.

He found that production and service jobs tended to become "deskilled" when technology is added. "Engineers' and supervisors' jobs, on the other hand," writes Lund, "tend to become more demanding."

MIT's Harley Shaiken, who comes from the labor side, concludes: "If labor does not find a way to control technology, then management will use technology to control labor."

Clearly, automation will remain a key labor-management issue in the coming decade. Yet, much of debate so far is based on the old industrial paradigm of labor-management relations. Technology is seen by labor as management's latest tool for harnessing workers.

In THE THIRD WAVE, Toffler expressed considerable optimism that computers, one of the agents of the Third Wave, will have a positive social impact and will help us to cope with societal changes. Toffler notes:

"Linked to banks, stores, government offices, to neighbors' homes and to the workplace, such computers are destined to reshape not only business, from production to retailing, but the very nature of work and, indeed, even the structure of the family." (p. 140)

"Humanity faces a quantum leap forward. It faces the deepest social upheaval and creative restructuring of all time. Without clearly recognizing it, we are engaged in building a remarkable new civilization from the ground up. This is the meaning of the Third Wave." (p. 10)

The same message was pointedly concluded by Evans (p. 152) in THE MICROMILLENIUM:

"The world is already complicated to the point of desperation, and the complication is almost entirely of our own doing. In order to support a growing, increasingly more affluent civilization, we have applied science and technology mercilessly to assist us. The result has been an even more complex world, demanding even deeper excursions into advanced technology which in turn complicate the world yet further.

Is there any way out of this technological trap? Possibly, but only by taking a momentous step whose consequences are frighteningly hard to assess. The step is this: realizing that the problems of the world are moving out of our grasp we may shortly decide to look to our new companion, the computer, for a helping hand. When the limited powers of the human brain are stretched to the limit, our only option will be to turn to the theoretically limitless powers of the machines for assistance. And the machines, slowly at first but ever so surely, will gather themselves together and oblige."

ETHICAL, SOCIAL, AND ECONOMIC ISSUES

ACTIVITY II:

Read the attached article taken from the script for Program #16 of the series "On and About Instructions ... Microcomputers." Based on this article, the videotape that you viewed, and the excerpt from MEGATRENDS, respond to the following questions.

1. Several schools have reported recent cases of students gaining access to the school computer and changing grades. For example, at a high school in San Diego several "hackers" broke into the school computer and destroyed files, deleted grades, and tampered with homework. It is expected that such cases of computer abuse will become more and more common as schools increase their use of computers and students become more skilled in computing.

   Describe three procedures that could be used at your school to prevent or discourage the invasion of privacy and other computer abuses.

2. Each school should have a policy on software copyright. An example of such a policy, suggested by the International Council for Computers in Education, is attached. Read the policy and evaluate its appropriateness.

   Why do you believe that this policy is reasonable or unreasonable?

ETHICAL, SOCIAL, AND ECONOMIC ISSUES

(Taken from the script for Program #16 of the series "On and About Instructions ... Microcomputers".)

Just as the Industrial Revolution had a profound impact on our lives, so will the Postindustrial Revolution - or the Information Age. The Industrial Revolution changed life styles - bringing people from farms to work in factories and offices. The end result was increased wealth, possessions, and leisure time - as well as the coinciding problems of increased pollution, crime, and energy and material shortages. The Information Age, characterized by knowledge as being a primary resource and industry, and fueled by innovations in computer technology, will also have a significant, albeit as yet an undetermined, impact on our lives. Like the Industrial Revolution, the Information Age will precipitate great achievement and social changes. But it will also invite serious concurrent problems. Whether or not the disadvantages of computer technology will outweigh the many advantages will largely depend upon the extent to which computer users, and society in general, recognize and understand the ethical implications of the impact of computers in society.

Most authorities in computer education recognize that the need for teachers and students to study ethical and social issues relating to the use of computers is just as important as the need for them to learn how to use a computer. For example, the definition of computer literacy by the Virginia Department of Education, as well as by such authorities as the Minnesota Educational Computing Consortium, Beverly Hunter, Allan Hofmeister and others, all emphasize that students should understand the ethical and social implications of computers in order to be considered "computer literate." This would include the study of such issues as the invasion of privacy, computer crime and abuse, the fair and equitable distribution of computers, job displacement, copyright law, artificial intelligence, and many more ethical issues.

Let's take a brief look at a few of these issues: the issues of privacy, copyright, equity and budgeting.

THE ISSUE OF PRIVACY

The right to privacy versus the need for information is a classical ethical dilemma. With the advent of the computer, and especially computer databanks, the issue has taken on new dimensions. The computer has greatly improved information services by increasing speed, accuracy, and the amount of data that can be stored and retrieved. Most authorities would also add that computers have improved the security of confidential information - you cannot view confidential information stored in a databank by simply entering a file cabinet.

It is the potential harm that computers may cause in relation to infringement upon our right to privacy that is alarming to some people. Banks, credit agencies, and many employers use computers to maintain confidential information on almost all of us. Certain governmental agencies have computer access to this information and several maintain their own large databanks, including the National Crime Information Center, the Internal Revenue Service, and perhaps the most powerful agency of all in terms of potential for invasion of privacy and social control - the National Security Agency, which collects intelligence data for various agencies such as the CIA and protects U.S. communications from foreign sources. Fortunately, George Orwell's visions of 1984 have not come true; but it is not because of shortcomings in computer technology.

THE ISSUE OF COPYRIGHT

You do not need a computer in order to violate the Copyright Law - you can copy a book on a copy machine, but as with other computer crimes the nature of the information stolen allows you to perform an unethical act with a computer in a fraction of the time that is required to obtain information by conventional means. The cost, and the risk of being caught, are also reduced.

Legally, you are entitled to make a duplicate copy of copyrighted software that you own, but only under two conditions, according to the Computer Software Copyright Act of 1980.

1. The new copy or adaptation is an essential step in utilization of the computer program. You may make a copy if the product instructs you to do so in order to make full use of the program. You are also entitled to modify programs to suit your own needs, as long as you do not distribute your modified program.
2. The new copy or adaptation is for archival purposes only, i.e., to make a backup copy in case the original is destroyed or lost. (Most publishers offer backups free or at reduced prices in order to discourage this.)

As with other tangible expressions of an author's ideas, original software developed by anyone is automatically protected by the Copyright Office. It is not necessary that the work be registered with the Copyright Office. You should assume that all software is copyrighted unless it was developed for free public use - in which case it should be clear that the copyright has been waived by the producer or that the development and production of the software was financed with public funds.

Thus, unless these two exceptions apply, or you have received permission from the software producer, you are violating the law whenever you copy a copyrighted program. It should also be noted that copyright guidelines are more complex in cases involving networks and multiple machine uses of software. Licenses granted by publishers for such uses usually help to clarify the issues involved.

EQUITY AND BUDGETING

Many educators are concerned that there are some schools where a student can receive three years of programming and other schools where the student is fortunate if he or she has one computer at school, much less a course about computers.

The findings of two recent studies, both conducted in 1983, substantiate this concern. A study conducted by John Hopkins University reported that 31% of the poorest elementary schools had computers, compared to 57% of the wealthiest schools. Similarly, a University of Minnesota study found that 31% of students in wealthy suburban and urban schools had used computers; while on the other hand only 16% of students in disadvantaged urban schools and 12% in rural schools had used computers.

Likewise, studies have shown that students with access to computers are more likely to be white than minority students, male than female, gifted than non-gifted, and to live in the west or midwest than in the southeast. Thus, you're in bad shape if you're a non-gifted minority female living in the southeast, and attending a poor rural school. If you do happen to have a computer in your school, the odds are that it is being used for remedial drill and practice exercises rather than to teach computer literacy or programming.

The equity problem does not only concern schools. It exists on a much broader level. The purchase of computers is a luxury item in many homes, and even in many nations, where more basic needs receive higher priority and can consume entire budgets.

The question we need to ask is: Is this a form of segregation? Discrimination? If so, the result may be that only privileged individuals will have access to computers - access that is critical to power and success in an information, or knowledge based society. Access that could be used to help fill the gap between the "haves" and "have nots".

This gap is likely to widen as competition for state and federal funds increases, unless the government intervenes. In affluent school districts local tax revenues and community donations may fill the void in funding. In 1983, PTA's of wealthy schools were responsible for almost 20% of the school computers purchases - and they will continue to contribute to such purchases. On the other hand, poor school districts may find no alternative sources of funding when federal and state funds are reduced. If computers are purchased with local funds, it is likely to be at the expense of reducing or eliminating other necessary programs.

OTHER COMPUTER RELATED ISSUES

In addition to the issues of privacy, copyright, equity and budgeting presented in the video program, there are many other computer-related ethical, social, and economic issues that teachers may want their students to explore. A list of such issues is given below:

Computer Crime and Abuse
Robotics
Artificial Intelligence
Responsibilities of Computer Programmers and Users
Supercomputers (The Fifth Generation)
The Information Age
Electronic Funds Transfer and Banking
The Cashless Society
The Electronic Cottage
Computers: Personal or Impersonal?
Video Games
Computerphobia
Computers and Job Displacement
Government Control - "1984"
Naisbett's "High Tech/High Touch"
Future Predictions
Impact on Thought and Behavior

SUGGESTED DIVISION POLICY ON SOFTWARE COPYRIGHT

It is the intent of ___________________ to adhere to the provisions of copyright laws in the area of microcomputer programs. Though there continues to be controversy regarding interpretation of those copyright laws, the following procedures represent a sincere effort to operate legally. We recognize that computer software piracy is a major problem for the industry and that violations of computer copyright laws contribute to higher costs and greater efforts to prevent copies and/or lessen incentives for the development of good educational software. All of these results are detrimental to the development of effective educational uses of microcomputers. Therefore, in an effort to discourage violation of copyright laws and to prevent such illegal activities:

1. The ethical and practical problems caused by software piracy will be taught in all schools in the Division.

2. Division employees will be expected to adhere to the provisions of Public Law 96-517, Section 7(b) which amends Section 117 of Title 17 of the United States Code to allow for the making of a backup copy of computer programs. This states that "...it is not an infringement for the owner of a copy of a computer program to make or authorize the making of another copy or adaptation of that computer program provided:

    a. that such a new copy or adaptation is created as an essential step in the utilization of the computer program in conjunction with a machine and that it is used in no other manner, or

    b. that such a new copy and adaptation is for archival purposes only and that all archival copies are destroyed in the event that continued possession of the computer program should cease to be rightful."

3. When software is to be used on a disk sharing system, efforts will be made to secure this software from copying.

4. Illegal copies of copyrighted programs may not be made or used on school equipment.

5. The legal or insurance protection of the Division will not be extended to employees who violate copyright laws.

6. ___________________ of this school district is designated as the only individual who may sign license agreements for software for schools in the division. (Each school using the software also should have a signature on a copy of the software agreement for local control.)

7. The principal of each school site is responsible for establishing practices which will enforce this policy at the school level.

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FUTURE PREDICTIONS

ACTIVITY III:

As the last activity for the in-service program, read and think about the following predictions relating to computers in society. The predictions are excerpted from THE BOOK OF PREDICTIONS by David Wallechensky et.al.: William Morrow, N.Y. 1981.

By Predictor David Pearce Synder, writer, futurist, and an editor of THE FUTURIST magazine.

"EVENTS THAT ARE 90% PROBABLE"

1982-1984	"Information crimes rise sharply. Computer fraud, commercial espionage, and theft of software, data, and copyrighted material become the most common form of grand larceny, and there is a burgeoning black market in stolen or bootlegged information products amounting to billions of dollars annually."
1983-1985	"Electronics Funds Transfer System (EFTS) is installed nationwide: use of cash begins to diminish, particularly in suburbs, business districts, and satellite cities, where electronic point-of-sale terminals are installed by most retailers."
1985-1987	"At least one-half of all United States households are connected to an interactive videodata communications network, which permits shopping and working from the home and two-way discussions with the instructors of televised classes, political candidates, and public officials."
1986-1988	"At least one-half of all United States households are equipped with an inhouse computer of sufficient capacity to handle all bookkeeping, financial and tax management, energy monitoring and control, and all other domestic record-keeping.

COMPUTER NOMINATED FOR NOBEL PRIZE

Predictor MALCOLM PELTU, editor of the British publication Computer Weekly and Dataweek, is also computer consultant to New Scientist magazine. A former employee of the British computer manufacturer ICL, Mr. Peltu specializes in interpreting the way information technology (computers, microelectronics, telecommunications, etc.) affects personal, social, and working life-styles.

PREDICTIONS

1982-1984	Computers accepted as expert professional consultants; for example, as medical diagnosticians, tax advisers, oil-exploration specialists, and chemical analysts.
1984-1986	Computers widely used as automatic translators of texts by international bodies.

1985-1987	Computer program beats world chess champion.
1986-1988	Traditional office desk and filing cabinet largely replaced by an electronic, computer-controlled "work station" which handles all voice, text, and pictorial information storage and processing.
1986-1989	Traditional mail services largely replaced by the use of digital electronic transmissions; for example, between word processors (computerized typewriters) in the office, and between home computers.
1988-1990	Computer program makes original scientific discovery that is considered worthy of a Nobel Prize.
1990-1992	Opening of first full-production, commercial, automated factory in which there is no human intervention between the receipt of an order and the dispatch of goods. Keyboard ceases to be main method of communicating between a person and a computer, and is replaced by direct-speech communication (including automatic typewriter, which accepts speech input and then produces the typed version); visual recognition of text, pictures, and objects by the computer; and pictorial and animated displays.
1993-1996	Traditional classroom-based teaching largely replaced by the widespread use of computer-assisted learning devices, including lectures and activities recorded on video discs; these devices will be located mainly at home, in community centers, etc., rather than in buildings devoted solely to education. Widespread use of computer programs written by computers, i.e., self-programming computers.
1995-1998	Fully mobile robots that can recognize objects and respond to human speech; widespread use of such robots in dangerous environments; for example, undersea exploration and maintenance of oil rigs.
1997-2000	Medical, commercial, and military use of techniques that directly link human brain to computer or microprocessor; for example, to control artificial limbs and overcome blindness and other physical disabilities, or to control aircraft and missile launchers where split-second timing is vital.
2010	Robot that can cross busy highway without being hit.
2020	Robot developed with a measurable IQ of over 100.
2030	Computers and robots become more intelligent than humans and make major economic, social and technical decisions using reasoning that is beyond human comprehension.

Taken from THE BOOK OF PREDICTIONS by David Wallechinsky et.al.
William Morrow, N.Y., 1981.

COMPUTER BUTLERS - AT YOUR SERVICE

Many people would like to (or at least imagine that they would like to) have a butler or chambermaid to get their day off to a comfortable start. A computer can play this role rather well. More precisely, one or more microprocessors, supported by considerable memory, programming, and peripheral devices, can play major parts of the role of a butler or a chambermaid well. The peripheral devices are certainly the most challenging. This application requires that many parts of your house be made computer peripherals, a task that is difficult, but completely practical, and certainly realistic for the person who would enjoy this job.

A terrific personal servant should start by planning, the night before, for your needs during the following day, considering how you will feel and what situations you will encounter. If you use your computer to keep your daily calendar for you, to print out your daily schedule of activities based on previously entered special and repetitive events, the computer has a good amount of the intelligence necessary to also start your morning off appropriately. You can enter other information the night before. Typically you might enter facts such as your being physically exhausted tonight and needing more energy in your breakfast tomorrow, and that your normal route to work is detoured so you will need to start your morning schedule 20 minutes earlier. A computer programmed with your biorhythm data can add considerable intelligence to next-day planning. Your computer can assemble all this information and prepare a schedule, activity plan, and personal "horoscope" for your review (and acceptance or modification) the night before, or you can simply elect to receive this as a set (surprise) plan the next morning.

Additional data could be accumulated during the night. A bed motion sensor (to measure how restless a night you had) might determine whether you needed an extra half hour of sleep. Weather sensors for variables such as temperature, wind speed and direction, and relative humidity could provide data to help your computer select your clothes and breakfast menu.

Come morning, your computer could really go into action. It could if you like, select and play music you would be likely to enjoy, or music to set your mood appropriately for the day's activities. The music could be gradually made louder or changed in tempo if you didn't awake soon enough. Before time to awake, your computer could, by operating appropriate controls, turn on your bedroom heater, coffee pot, and lights, and start hot water running for your morning bath or shower. Signals could be sent to the furnace to heat up various rooms as they would be needed. By unlatching bins in your ceiling, your computer could select clothes appropriate for your scheduled activities, and the weather, and drop these clothes onto your bed or in your dressing area.

Breakfast in bed is another service you could expect. mentioned before, your menu could be determined by the conditions you would face that day. Your computer could remember menus from prior days and also provide the desired amount of variety. Microprocessors control microwave ovens, and interfacing an oven to your home computer shouldn't be particularly difficult. Many vending machines have electrically controlled turntables to allow selection from a variety of hot and cold food. These or similar controls could be peripherals of your home computer. Construction of a simple version of a programmable food-dispensing machine shouldn't be difficult. There are several ways of transporting selected food from its preparation points to your bed. A model electric railroad is an interesting possibility. A breakfast-in-bed computer could also learn. For example, your computer might be programmed so that if you sent back 50% of your orange juice (determined by a scale sensing the weight of the returning "empty" dishes) two days in succession, your computer would give you only 75% as much juice the next day.

These computer services can continue through the day, but our explanation will stop here. The next steps in thinking about what your computer can do for you, and accomplishing these things, are up to you.

SOURCE: Reprinted with permission from YOUR HOME COMPUTER by James White, copyright 1977 by Dymax, P.O. Box 310, Menlo Park, Calif. 94025

APPENDIX

Recommended unit evaluation forms and pre/post test for in-service participants.

Evaluation Results, 1983-1985

EVALUATION FORM

Computer Inservice Program

"Computer Literacy"

The purpose of this course is to present teachers with an overview of computer concepts. It is not designed to give teachers an in-depth understanding of computer technology.

Given the items below, please rate Unit I: Introduction to the Computer.

A. After completing this unit, I was able to: (Please Circle)

1.	Identify hardware components (disk drive, monitor, keyboard, CPU).	YES	NO
2.	Define computer functions (input, processing, output).	YES	NO
3.	Define simple commands (load, list, catalog, save, run).	YES	NO
4.	Use simple commands (load, list, catalog, save, run).	YES	NO
5.	Load and run a program.	YES	NO

B. Content:

1. The unit required: greater than 3 hours 3 hours less than 3 hours

2. The quality of the material was: POOR 1 2 3 4 5 EXCELLENT

3. I plan to use this information in my classroom (if given the opportunity). YES NO

Comments/Suggestions:

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This form must be completed and returned to a computer inservice coordinator for course credit.

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EVALUATION FORM

Computer Inservice Program

"Computer Literacy"

The purpose of this course is to present teachers with an overview of computer concepts. It is not designed to give teachers an in-depth understanding of computer technology.

Given the items below, please rate UNIT II: Computer-Assisted Instructions.

A. After completing this unit, I was able to: (Please Circle)

1. Identify specific instructional strategies relating to computers. YES NO
2. Identify advantages & disadvantages to using the computer to do certain tasks. YES NO
3. Evaluate software for appropriateness of content and format. YES NO
4. Match software with instructional goals and objectives. YES NO
5. Identify types of information found in databases. YES NO

B. Content:

1. Time required to complete the unit: greater than 4 hours 4 hours less than 4 hours
2. The quality of the material was: POOR 1 2 3 4 EXCELLENT 5
3. I plan to use this information in my classroom (if given the opportunity). YES NO

Comments/Suggestions:

This form must be completed and returned to a computer inservice coordinator for course credit.

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EVALUATION FORM

Computer Inservice Program

"Computer Literacy"

The purpose of this course is to present teachers with an overview of computer concepts. It is not designed to give teachers an in-depth understanding of computer technology.

Given the items below, please rate Unit III: Introduction to Programming.

A. After completing this unit I was able to: (Please Circle)

1.	Use special function keys (e.g., Return Control, Reset, Shift).	YES	NO
2.	Analyze a task to determine if it is feasible to solve it on a computer.	YES	NO
3.	Describe a computer program as involving sequential statements, program commands and a logical design.	YES	NO
4.	Describe the use of a flowchart.	YES	NO
5.	Write a simple program.	YES	NO
6.	Run a simple program.	YES	NO
7.	Define "debugging" and "documentation".	YES	NO

B. Content:

1. The amount of work was: greater than 4 hours 4 hours less than 4 hours

2. The quality of the material was: POOR 1 2 3 4 5 EXCELLENT

3. I plan to use this information in my classroom (if given the opportunity). YES NO

4. Did you complete the LOGO or BASIC package? _______________

Comments/Suggestions:

This form must be completed and returned to a computer in-service coordinator for course credit.

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EVALUATION FORM

Computer Inservice Program

"Computer Literacy"

The purpose of this course is to present teachers with an overview of computer concepts. It is not designed to give teachers an in-depth understanding of computer technology.

Given the items below, please rate UNIT IV: Word Processing.

A. After completing this unit, I was able to: (Please Circle)

1.	Type, Edit, and Clear parts of a document.	YES	NO
2.	Get, Save, and Remove a document.	YES	NO
3.	Remove and Insert characters.	YES	NO
4.	"Define" a page of the document.	YES	NO
5.	Print a document.	YES	NO

B. Content:

1. The amount of work was:	greater than 4 hours		4 hours		less than 4 hours
2. The quality of the material was:	POOR 1	2	3	EXCELLENT 4	5
3. I plan to use this information in my classroom (if given the opportunity).				YES	NO

Comments/Suggestions:

This form must be completed and returned to a computer inservice coordinator for course credit.

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EVALUATION FORM

Computer Inservice Program

"Computer Literacy"

The purpose of this course is to present teachers with an overview of computer concepts. It is not designed to give teachers an in-depth understanding of computer technology.

Given the items below, please rate Unit V: Computers in Society.

A. After completing this unit, I was able to: (Please Circle)

1. Describe the impact of computers on the home and school. YES NO

2. Describe the impact of computers on business, business, industry, and government. YES NO

3. Identify the following ethical and social issues relating to the use of computers: copyright laws, equity, privacy. YES NO

4. Recognize the value of computer skills for future education and employment. YES NO

B. Content

1. The amount of work was:

greater than 2 hours	2 hours	less than 2 hours

2. The quality of the material was:

POOR			EXCELLENT	
1	2	3	4	5

3. I plan to use this information in my classroom (if given the opportunity). YES NO

Comments/Suggestions:

This form must be completed and returned to a computer in-service coordinator for course credit.

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COMPUTER LITERACY TEST

1. The computer has two kinds of memory. They are:

   a. CPU and DOT
   b. RAM and ROM
   c. RON and RAN
   d. SAM and TOM

2. What is a list of choices or subprograms in a computer program called?

   a. memory
   b. CUP
   c. menu
   d. flowchart

3. Which of the following is not an input device?

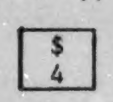
   a. keyboard
   b. disk drive
   c. tape player
   d. printer

4. What is the "brain" of the computer?

   a. Central Processing Unit (CPU)
   b. Read Only Memory (ROM)
   c. Random Access Memory (RAM)
   d. Disk Drive

5. Write the name of a computer program you have used without help from anyone else while using it. ______________________

6. Some keys on computer keyboards show two symbols. How would you make the computer print the upper symbol on the following key?



   a. hold the <CTRL> key down and press "4"
   b. press the space bar four times
   c. press "4" and then <RETURN>
   d. hold the <SHIFT> key down and press "4"

7. When you finish typing a line, which key do you press?

   a. CTRL
   b. SHIFT
   c. RESET
   d. RETURN

8. Which of the following math programs would most likely work on an Apple II+ computer with a disk drive and 64k memory?

   a. A math program for the Radio Shack TRS 80 with 64k memory.
   b. A math cassette tape for the Apple computer.
   c. A math program made for the Apple II+ computer with 48k memory.
   d. none of the above

9. Which type of software would you use to send 50 form letters to 50 different people?

   a. spreadsheet
   b. typewriter
   c. word processor
   d. CAI

10. A computer program is needed for a computer to:

    a. solve a problem.
    b. print a message.
    c. produce an output.
    d. all of the above

11. When in operation, a computer:

    a. thinks just like a person.
    b. decides what to do with the data.
    c. follows a series of logical instructions written by people.
    d. translates data from digital to analog code.

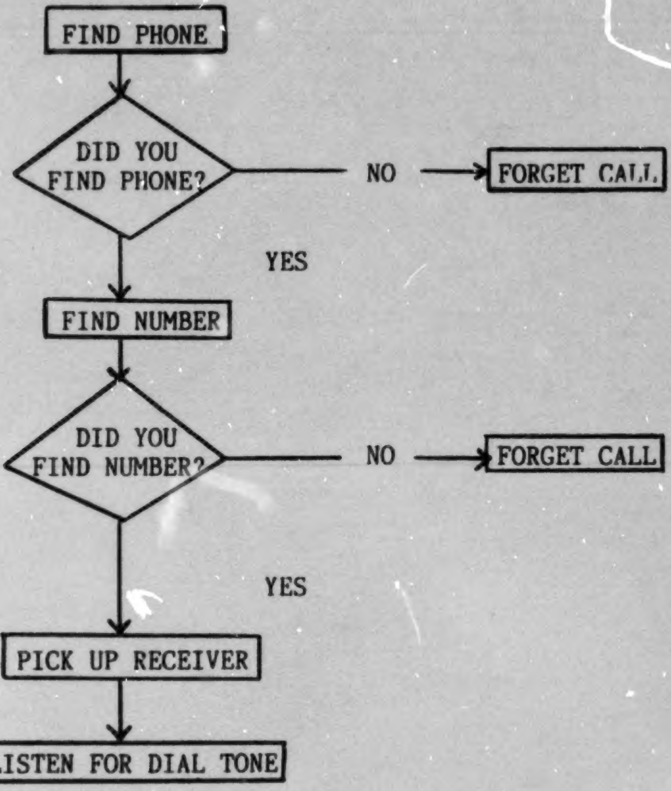
12. Choose the correct output for the following instructions.

    1. List the 3 names Brown, Anderson, and Crane in alphabetical order.
    2. Remove the last name from the list.
    3. If only one name is left, stop. Otherwise go on to step 4.
    4. List the remaining names in reverse order.
    5. Go back to step 2.

    Output:

    a. Anderson, Brown, Crane
    b. Brown
    c. Anderson, Brown
    d. Anderson

The following chart contains a plan for making a telephone call. The following question asks about this chart.


FIND PHONE
DID YOU FIND PHONE?
NO
FORGET CALL
YES
FIND NUMBER
DID YOU FIND NUMBER?
NO
FORGET CALL
YES
PICK UP RECEIVER
LISTEN FOR DIAL TONE

(question on next page)

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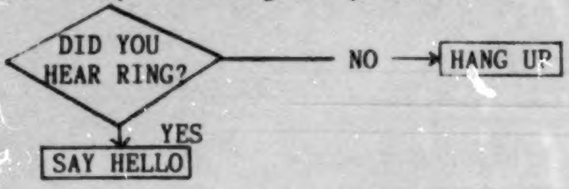
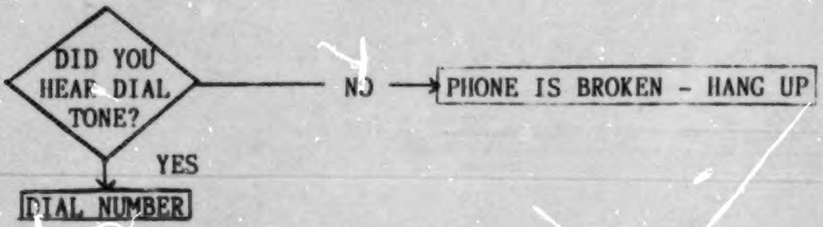
13. What is the next step in making the phone call?

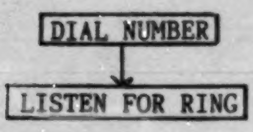
a.


DID YOU HEAR RING?
NO
HANG UP
YES
SAY HELLO

b.


DID YOU HEAR DIAL TONE?
NO
PHONE IS BROKEN - HANG UP
YES
DIAL NUMBER

c.


DIAL NUMBER
LISTEN FOR RING

14. Which of the following periods in history is the computer least related?

a. Industrial Age	c. Space Age
b. Information Age	d. Computer Age

15. In business, which tasks are performed by computers?

a. making products
b. billing for the cost of products
c. keeping records
d. all of the above

16. Computers work best for tasks that require:

a. creative ideas for many different problems.
b. human judgement.
c. speed, repetition, and accuracy.
d. all of the above

17. Which of the following areas has the computer changed the most and is likely to continue to change?

a. the study of outer space	c. farming
b. education	d. dog catching

18. The increased use of computers in our society:

a. only creates new jobs.
b. only takes away jobs.
c. both creates jobs and takes away jobs.
d. replaces human decision making.

19. Which statement about computers is most accurate?

a. Computers are tools that can be used for good or bad purposes.
b. Computers only help people do things faster and better.
c. Computers will cause widespread unemployment.
d. Computers will begin to control people.

20. The computer skill that most people will need in the future to perform their jobs will be:

   a. BASIC programming.
   b. the use of a computer keyboard.
   c. computer programming.
   d. all of the above.

21. What is the main duty of a computer programmer?

   a. operate a computer center
   b. prepare instructions for a computer
   c. schedule jobs for a computer
   d. design computers to do certain jobs

22. To access a database information system with a microcomputer, you:

   a. call the database by using some type of modem connected to telephone lines and your computer.
   b. dial the database number, and talk to the computer operator at the database system.
   c. must have a cable TV hook-up to the host computer.
   d. must go to a large computer center.

23. Which best describes a database?

   a. The part of a computer program where numbers are located.
   b. A collection of information.
   c. An electronic device attached to the computer that allows data to be sent over telephone lines between computers.
   d. A part of a computer system used to store data.

Teacher's Self-Ratings:
Objectives Mastered

1983 - 1985

Unit I: Introduction to the Computer

Objectives:	% Responding YES	NO	BLANK
1. Identify hardware components (disk drive, monitor, keyboard, CPU).	100%	-0-	-0-
2. Define computor functions (input, processing, output).	100%	-0-	-0-
3. Define simple procedures (load, list, catalog, save, run).	93%	05%	02%
4. Use simple procedures (load, list, catalog, save, run).	91%	07%	02%
5. Load and run a program.	96%	04%	-0-

Unit II: Instructional Uses of Computers

1. Identify specific instructional strategies relating to computers.	90%	05%	05%
2. Identify advantages and disadvantages to using the computer to do certain tasks.	95%	05%	-0-
3. Evaluate software for appropriateness of content and format.	92%	08%	-0-
4. Match software with instructional goals and objectives.	63%	03%	34%
5. Identify types of information found in databases.	53%	08%	39%

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Teacher's Self-Ratings:
Objectives Mastered
1983 - 1985

Unit III: Introduction to Programming

Objectives:	% Responding YES	NO	BLANK
1. Use special function keys (e.g., Return, Control, Reset, Shift).	100%	-0-	-0-
2. Analyze a task to determine if it is feasible to solve it on a computer.	73%	25%	02%
3. Describe a computer program as involving sequential statements, program commands, and a logical design.	85%	11%	04%
4. Describe the use of a flowchart.	95%	04%	01%
5. Write a simple program.	90%	10%	-0-
6. Run a simple program.	91%	07%	02%
7. Define "debugging" and "documentation".	84%	15%	01%

Unit IV: Word Processing

	YES	NO	BLANK
1. Type, edit, and clear parts of a document.	100%	-0-	-0-
2. Get, save, and remove a document.	100%	-0-	-0-
3. Remove and insert characters.	100%	-0-	-0-
4. "Define" a page of the document.	89%	11%	-0-
5. Print a document.	89%	11%	-0-
6. Think of ways to use a word processor in my teaching.	89%	11%	-0-

Unit V: Computers In Society

	YES	NO	BLANK
1. Describe the impact of computers on the home and school.	95%	03%	02%
2. Describe the impact of computers on business, industry, and government.	92%	05%	03%
3. Identify the following ethical and social issues relating to the use of computers: copyright laws, equity, privacy.	79%	18%	03%
4. Recognize the value of computer skills for future education and employment.	89%	03%	08%

INSERVICE RATINGS

1983 - 1985

Item 1: **The amount of work was:**

UNIT	TOO MUCH	JUST RIGHT	TOO LITTLE	BLANK	TOTAL
I	5	43	1	5	54
II	21	34	1	3	59
III	12	39	0	4	55
IV*	6	3	0	0	9
V	25	37	0	1	63
TOTAL	69	156	2	13	240
%	29%	65%	01%	05%	

* * * * * * * * * * * * *

Item 2: **The quality of the material was:** (1 = Poor -- 5 = Excellent)

UNIT	1	2	3	4	5	BLANK	TOTAL
I	1	0	14	14	15	0	44
II	0	7	25	23	4	0	59
III	2	5	18	22	7	1	55
IV*	0	1	3	3	1	1	9
V	4	7	27	16	9	0	63
TOTAL	7	20	87	78	36	2	230
%	03%	09%	38%	34%	16%	00%	

Unit I: Introduction to the Computer
Unit II: Instructional Uses of Computers
Unit III: Introduction to Programming
Unit IV: Word Processing
Unit V: Computers in Society

* Note that Unit IV was not used during the 1983-84 training session. Nine participants evaluated the unit during the 1984-85 session.

Item 3: **The class presentation/program was:**

UNIT	1	2	3	4	5	BLANK	TOTAL
I	0	1	14	14	15	0	44
II	0	0	20	16	11	2	49
III	2	1	5	18	20	0	46
IV*	0	0	0	0	0	0	0
V	0	2	18	17	14	2	53
TOTAL	2	4	57	65	60	4	192
%	01%	02%	30%	34%	31%	02%	

* * * * * * * * * * * * *

Item 4: I plan to use this information in my classroom (if given the opportunity).

UNIT	YES	NO	MAYBE	?	BLANK	TOTAL
I	41	9	2	0	2	54
II	51	4	0	3	1	59
III	39	10	0	3	3	55
IV*	7	1	0	0	1	9
V	51	8	0	1	3	63
TOTAL	189	32	2	7	10	240
%	79%	13%	01%	03%	04%	

* Note that Unit IV was not used during the 1983-84 training session. Nine participants evaluated the unit during the 1984-85 session.

Unit I: Introduction to the Computer
Unit II: Instructional Uses of Computers
Unit III: Introduction to Programming
Unit IV: Word Processing
Unit V: Computers in Society